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TREATMENT OF ACUTE NON-TUBERCULOSIS EMPYEMA OF THE PLEURA

PROF. RUDOLF DEMEL,
Vienna

How old the surgical treatment of acute suppuration of the pleura is we can judge from the fact that, in the writings ascribed to Hippocrates and Euryphon von Knidas, very different methods for the treatment of empyema of the pleura are mentioned. Already at that time exactly as to-day the empyema cavity was opened widely, either with knife or with a red-hot iron; or, what was a very complicated thing at that time, a method was used by which the cavity of the chest was emptied of the pus by boring into the rib. Then curiously, many, many centuries passed before the technical, essentially simple thoracocenteses and paracentesis-thoracis appeared, of which, above all, Laurentius Heister and, later, Schuh made extensive use and for which they used the trocar. This gave the impulse to the introduction of aspirators, from the different models of the celebrated apparatus of Dieulafoy and Potain to those of to-day, all of which are well-known to you.

The results of the operation for empyema, even in ancient times as well as in the Middle Ages, were generally so unfavourable that, according to old reports, it was considered a great exception when the patient's life was saved. It was reserved for Dieffenbach to heal two-thirds of his patients. The confidence that was felt in this operation at that time can best be judged from the well-known saying of Dupuytren. Though he was known as an advocate of operative treatment, when he himself was ill of pleura-empyema he refused the operation, saying: "I would rather die by the hand of God than by the hand of a surgeon."

When we compare the modest results of the oldest treatment of empyema with the successes of the last several decades, we must recognize distinct improvement. However, to-day we have not yet advanced so far as to be able to give a favourable report of operative successes. The 30 to 40 per cent. and still higher of mortality among the operated cases of the pleura-empyema to-day—and also the 30·4 per cent. in clinic Eiselsberg (1931) must also be regarded as too high. The circumstance that from other sources we hear much more favourable reports about the mortality (20 per cent. to 40 per cent.) and, especially the increasingly great number of proposals to treat empyema, leads us to think that the points of view on the treatment of acute and not specific pleura empyema (and it is only of this form that we wish to speak at present) are not yet unanimous and also that the effective accomplishment of the different operative methods which we can use to-day are not properly valued.

In order to look into this operation more nearly, I should like to mention briefly the different methods in use to-day. Of such the following come into consideration:

(1) The simple puncture of the effusion of the pleura, which can be repeated as often as is wished—

either with a simple needle and syringe or with the apparatus of Dieulafoy and Potain.

(2) Of the method with open drainage of the empyema cavity we may mention the simple incision of the rib (pleurotomy), the primary resection of the rib, trepanning of the rib (which is nowadays almost entirely given up) and the undertaking of operation in a pneumatic chamber which, at the suggestion of Mikulicz, was worked out by Sauerbruch and brought into practcie by Brauer. It consists of a resection of two or three ribs, a division of the pleura under over-pressure, the emptying of the effusion, and at the end the filling of the pleural cavity with a tampon.

3. The procedure with air-tight drainage is represented by the widely spread method of syphon drainage according to Bulau. It is so well known that I do not need to speak of similar apparatuses, such as those by Mozingo, Singer, Soresi, Tiegel and others.

4. Further, there are methods of air-tight drainage in connection with rib resection that go back to the arrangement of Revilliod and Storch and also other similar working instruments, such as the apparatus of Flesch, Iselin, Mikulicz, Nordamnn, Seidel and others, which through the method of Perthes-Hartert, have been put into practice. The substance of the Perthes-Hartert method is that, after thoracotomy with rib resection, the wide operation wound is closed with an air-tight rubber in which an air-tight tube is inserted. To this tube an aspirator is attached, by the help of which pleura exudation is withdrawn.

If we now ask ourselves, what the different methods can accomplish, in other words, for what forms of acute empyema they are most likely to come into question, the following is to be said:

By puncture the empyema cavity is seldom completely emptied; at most it is only partially evacuated. However, after partial emptying of the effusion, the lung which was compressed before can expand, especially because as we know, very frequently the resorption of the remaining effusion will be encouraged by the puncture. Puncture has a further advantage; namely, it can be repeated as often as wished. However, in order to be successful, it must not be undertaken with a very fine needle, especially if there is a thick exudation. Besides, care must be taken when there is no pneumothorax, that, with the puncture, no air penetrates into the empyema cavity.

A further advantage of treatment with puncture is that it has a very small mortality, and that even in difficult cases the condition of the patient is so far improved that the proposed operation can be undertaken later, with the greatest probability of better success.

Treatment by puncture can be tried in all forms of empyema, with the exception of the septic or putrid form. In no case is the relieving (also repeated puncture) so well justified as in the case of patients with displacement of the mediastinum or of the heart, who mostly come for operation in urgent cases. In such cases every other action which would result in a too quick removal of the heart displacement, would lead to a disastrous disturbance of the circulation.

The simple puncture comes into consideration for early empyema, also as long as the discharge is not really purulent, for bilateral exudation, and for patients who are in a bad state of general health, as well as for empyema in children and for metapneumonic influenza and streptococcal empyema in adults. Even if a large number of cases can be healed by simple puncture, still puncturing should not be continued too long, especially when it is noticed, that the remaining discharge shows no inclination to dry up and that the complaint of the patient will not relax. In such a case it would be better to try some other method earlier. The process of air-tight drainage, especially the syphon drainage of Bülau, comes into consideration. With this a somewhat thicker discharge will doubtless be drawn off better than is possible by puncture. A discharge that is thick and rich in fibrin and is therefore difficult to empty, can be treated by thinning the exudation either with a physiological salt solution or some other means of liquefying. For this we have found a solution from Sauerbruch-Hermannsdorfer particularly suitable:

Pepsin 20·0
Acid. mur. acid. carbol. aa 2·0
Aq. dist. 400·0

A disadvantage to air-tight drainage is that, wherever the drainage lies for some time, the rubber tube is not held fast enough by the soft parts of the thorax wall and, in consequence, it can very easily fall out of the empyema cavity. This will be found to be very unpleasant, because on the one hand, air penetrates into the cavity and the lung is prevented from expanding again and, on the other, retention of pus can very easily be caused. In consequence of the syphon effect in this method the discharge is drawn out of the empyema cavity, even if the syphon effect is not certain and not constantly in action.

Air-tight drainage is, above all, suitable for empyema in children during the first two years of life most of whom can be cured by the help of this method. It comes further in question for the pneumonic influenza and streptococcal empyema of adults, the prognoses of which (especially streptococcal and influenzal empyema) are very bad, therefore at least in the beginning of the illness radical operation cannot be considered.

Under radical treatment comes the method with open drainage. Even in their simplest form, that of pleurotomy, and still more in thoracotomy with rib resection, such operations are serious, because they are inseparably connected with the beginning of acute pneumothorax, which very specially favours infection of the pleura and exercises an unfavourable effect on the course of the disease of the lung. Besides, acute pneumothorax in cases with relaxation of the mediastinum leads to disturbance in breathing and heart-action, which is dangerous to life. Even the wide opening of the pleural cavity in a pneumatic chamber is not without danger in such cases, although it must be admitted that, only with the help of this method, has it become possible to open the pleural cavity without special danger for the patient.

The wide opening of the empyema cavity after rib resection is dangerous, also, when operation is undertaken before the lung illness has ceased and the exudate has not yet become suppurative, but has still a serous or serofibrinous appearance; because at this time the pleura mediastinalis is generally yielding. That was also the reason why Perthes reckoned that the fourth week of illness was the most favourable time for rib resection. He did not want to attain anything else; he simply wished to await the first phase of the infection before opening the pleura.

The further disadvantage of open drainage is the circumstance that healing, even in the most favourable cases, takes a very long time. In general, the healing goes on, because on the one hand the pleura pulmonaris grows together with the pleura costalis from the farther points of the empyema toward the wound, and, on the other, that the thorax-wall retracts, which can be expected of a youthful thorax rather than of one of an adult patient; notwithstanding open drainage, even in the best hands, in 15 to 20 per cent. of the cases this leads to residuary empyema cavities.

In consequence of the pneumothorax these operations lead to collapse of the lungs, whereby the lung discontinues active breathing for a long time and, by persisting in a state of repose, the formation of a residuary empyema cavity is favoured. Besides, the obliteration or reduction of these cavities miscarries on the callosities of the pleura pulmonalis and costalis, which owe their origin to the constant irritating effect of the discharge.

On account of the danger and disadvantages connected with primary rib resection it has lately lost more and more value and is being substituted by secondary resection.

The wide thoracotomy with rib resection is the first to come into consideration in metapneumonic empyema of adults and in empyemas that arise from penetration by gangrene and abscesses as well as by pleura sepsis.

We can more easily decide on rib resection where there are already adhesions, in which there is no more danger that total pneumothorax will occur. In this sense rib resection is the best method to recommend for interlobar empyema. Incision in the fifth intercostal space, right as well as left is the easiest method of attaining the slanting slit and after the resection of one or more ribs (IV—VI) the interlobar empyema is laid wide open.

For children of one or two years of age, primary thoracotomy with resection is very dangerous.

In comparing results of the method of air-tight and open drainage the most striking thing is the difference in mortality. According to the literature

the mortality in air-tight drainage is half as much as that in open drainage. Besides, when we think that the air-tight drainage method is used mostly in the first place in severe cases, for weak patients, and for children in the earliest years of life then the lower mortality is all the more important.

Starting with the thought that empyema is only to be healed when the collapsed lung is again expanded and, further, that aspiration has an important adverse effect on the resorption of the exudation, one is proposed to use the syphon method in conjunction with rib resection. However, one great disadvantage of this method is that the principal requirement of Perthes, to keep the empyema cavity air-tight from the outside, has not yet been fulfilled, in spite of the different proposed constructions. Besides, the apparatus of Perthes is attached to the water pipe, so that the patient's bed must be placed near this.

As to what pressure should be used by the syphon method, we can say, that, without doubt, the pressure must not be too high at the beginning of the treatment to avoid possible premature adhesion of the lung surface to the pleura-parietalis, which would result in retention of the suppuration. In the first few days as much discharge should be drawn off as corresponds to the natural expansion of the lung; also the patient ought not to feel any pain.

The aspiration methods find their use especially in acute and uncomplicated empyema in meta- and para-pneumonic forms, and, indeed, only in cases in which the lung on the side of the empyema is healthy. They must fail wherever the pleura cavity is in connection with the bronchial tree or when, in consequence of the long continuance of the illness, it has become rigid. If, therefore, the use of the syphon-drainage method seems to be somewhat restricted, they still do not lose in importance, because by their use, as we can see from the literature, mortality has been greatly reduced.

In our discussion we have referred to the principal methods of the operative treatment of pleura empyema. We shall now give some directions for the treatment of acute, not specific, empyema, according to experience.

In the course of time, we must first come to the conviction that the collection of pus in empyema is not to be treated as in an abscess, and that the emptying of the suppuration must follow other laws than in the case of an ordinary abscess in the soft parts.

With consideration for the above-mentioned injurious effect of acute pneumothorax on the activity of heart and lungs with a still movable mediastinum and on the deterioration of the pleura infection in existing pneumothorax, preference must be given to the air-tight drainage over the open one. Also, the shorter time of healing in air-tight drainage speaks for the closed method. A further advantage of the air-tight drainage is that it prevents too quick emptying of the pus, which we know, that in consequence of a sudden displacement of the heart, can often be dangerous to the patient. Air-tight drainage makes it much more possible to suspend the emptying at will and, above all, to empty the pus slowly.

From the standpoint of pathological physiology and pathological anatomy the pleural discharge cannot be regarded as only a troublesome foreign body, on the soonest possible removal of which the organism works with all its might. The exudation is much more to be considered as a local reaction of the pleura. As the pleural discharge harbours the microbes of discharge and its toxins, it plays a part in the formation of antitoxin that must not be neglected; for, the antitoxin being absorbed, the body is supported in its fight against infection. If the discharge for the whole period of illness were simply superfluous it could not be explained how, after complete emptying by puncture, discharge always appears again soon. This is especially to be observed in cases in which the process in the pleura or in the lungs has not been quite successful and is not overcome by the body. For this reason, owing to the certain, if also temporarily limited, usefulness of the discharge, we should not insist upon earliest possible evacuation. Only in cases in which, because of its amount, the discharge displaces the neighbouring organs (heart, lungs and vessels) and hinders their function, we are obliged, to act differently towards the exudation.

This opinion is corresponding to a method, without danger, to begin the treatment of empyema by puncture. The first punctures afford us the possibility of examining the discharge bacteriologically, and thus of learning the nature of the ill-

ness. We know that the prognosis of the illness is dependent upon the sort of microbes found. For instance, it is known that the pneumococcal pus is relatively benign whereas, streptococcal and influenza infections are distinguished by many complications and great mortality.

Therefore, the treatment of empyema to-day should not be decided upon before bacteriological examination has been made, because the further plan of treatment depends upon the result of such examination. If to-day we believe that careful, slow emptying of the pleural discharge by means of air-tight drainage is the suitable method, we also know that healing of the pleural suppurations without fistula, without leaving behind a remnant of the empyema cavity, without re-expanding of the lung, is not to be thought of; for the other factors, that help in the reduction and disappearance of the cavity by the emptying of the exudation (as, for instance, the sinking of the thorax wall, the dislodgment of the diaphragm upward, the expansion of the lung of the healthy side, and the wandering of the mediastinum to the diseased side) are completed so slowly, that they are only affected when we have, not an acute, but a chronic empyema before us.

Naturally, the automatic expansion of the lung is possible only in early cases as long as the elasticity of the lung has not suffered much in consequence of formation of callosity on the pleura pulmonalis. The circumstance that we often have patients upon whom we have used only the precautionary puncture method, because process of disease of the lung and the pleura has not been concluded, compels us all the more, to care for the lung expansion. For this purpose the syphon method has been created, so that the remaining of cavities may be avoided at least in comparatively fresh cases.

Until now the aspiration methods were joined with resection of one or several ribs. The literature of the last few years distinctly reveals the attempt to refrain as much as possible from using the broad opening of the pleural cavity. It cannot be immaterial if in so practically arranged a structure as the thorax is, whose perfect functioning and direct influence on the activity of the heart and lungs depend upon the pressure of the outer air and the pressure conditions in the chest cavity, a wide window is made without compelling reasons. To do so one of the main conditions would be destroyed which the thorax, in fulfilling its duty, needs so much. For this reason primary rib resection cannot to-day play the part it played at the time of Franz König, when it was considered the method of choice.

Especially in fresh cases, in which acute disturbance of the intrapleural pressure relations is to be reckoned with, not only must a strict emptying of the discharge be cared for, but also closure of the chest cavity must be strictly maintained.

These requirements are fulfilled by an apparatus made by us, which already in a great number of cases has proved good and which has realized an air-tight suction method in distinction from the aspiration method which up to the present time has been preceded by open drainage.

The instrument is composed of three parts put together; namely, one part, which is built into the thorax wall and serves for the air-tight drainage of the empyema cavity; a tube as preparation for the drawing off of the suppuration; and a suction apparatus, consisting of an evacuation pump which is connected with the collecting vessel. The collecting vessel is joined to a manometer by which the pressure used during the suction is measured.

The part of the apparatus that is to be fastened on the thorax wall consists of two metal tubes of equal size, separated from each other and formed like a trocar, which are bent into a half circle and by means of a fastening are joined so as to make a complete circle. This part of the apparatus must be sterilized by boiling before the operation.

The whole operation consists of two puncture incisions, one of which is made on the upper edge of a rib, and the other on the upper edge of the next rib lying below the first. In these puncture incisions, which only go through the skin and the intercostal musculature and which leave the pleura costalis uninjured for the moment, the two small tubes of the apparatus are introduced with a twisting movement, one after the other, into the empyema cavity by which the pleura costalis is simply pierced. The tubes that are introduced into the empyema cavity are joined together in the correct corresponding position by a plug. Besides, on the apparatus a splint is fastened which is made of supple brass material so that it can be placed on every part of the

thorax wall. Finally, the splint, with the apparatus, is fixed to the thorax wall by a circular bandage.

The apparatus has the following advantages: It is possible to put the apparatus air-tight into the empyema cavity, and by watching the hand of the manometer, to regulate the slow emptying of the discharge. The negative pressure which is created by the absorption should not, in the first few days after the operation, exceed one-sixteenth of the atmosphere (that is, 47 mm. Hg.). Change of bandage is seldom necessary and when it must be done later, the suction apparatus need not be interrupted, as in the other similar methods. It is easy to avoid injury to the arteria intercostalis. Because of the blunt nature of the apparatus injury to the lung is impossible. The part of the instrument lying intrapleurally is in the neighbourhood of the inner surface of the thorax wall, so that shortening or displacement of the drainage tube is excluded. The apparatus consisting of two parts, completely clasps a rib, thus preventing it from falling out. The apparatus can be rinsed out at any time without being taken out or changed. It is further, not dependent upon a water pipe and, after the first few days following operation, allows the patient comparative freedom of movement. In a favourable course of the illness the patient can go about in the room with the apparatus in place, whereas the other suction mechanism of the apparatus must first be removed.

Should this air-tight aspiration method for some reason not succeed in its aim, then secondary thoracotomy with rib resection can be undertaken.

I should like to say a word or two about the rinsing of the empyema cavity. A large number of different antiseptics have been recommended for this purpose. In Austria and Germany experience with them up to the present has not led to any convincing result and, besides, the opinions of foreign clinics are in many ways contradictory. We have seldom made use of rinsing, and it has been only in cases of mixed infection that we used Dakin-Carrel's or Pregl's solution.

In concluding I should like to point out that in pleural empyema we can speak of no uniform treatment even to-day; the cautious and experienced surgeon will proceed individually. He must bear in mind that the treatment must be saving and that it must not make still further demands upon the strength of a weakened organism.

With the healing of suppuration of the pleura, the treatment is not finished. After every empyema there remain changes in the affected organs in the form of adhesions of the pleura layers, wheals on the lungs, enlargements of the bronchi on the affected side, distension of the lungs on the healthy side, displacement of the heart, etc.—changes which diminish the functional capacity of these organs. In order that these difficulties can disappear without any remains, the changes must be subjected to an appropriate, well-carried out after-treatment. We have found the lung gymnastics of L. Hofbauer to be the best, because they consider to a great degree the functional side of the affected organs.*

*Read at a Clinical Meeting held under the auspices of the Calcutta Branch, I. M. A. on 15-12-27.

SERUM AND OTHER SPECIFIC TREATMENTS OF SMALL-POX

PURSOTAMDAS T. PATEL, M.D. (Lond.), M.R.C.P. (Lond.), D.T.M. & H. (Cantab.), F.C.P.S. (Bom.).
Medical Superintendent, City Fever Hospitals, Arthur Road, and Maratha Tuberculosis Hospital, Hony. Physician, K. E. M. Hospital, Bombay.

In order to find out the possibilities of treating small-pox effectively with serum I began the investigation in the year 1924. After the experimental work which we carried out in the years 1924, 1925, 1926, 1929 and 1933, I am inclined to accept the conclusion of William Councilman, who believes that there is not much to hope from the serum treatment of the disease. It is perfectly true that the blood serum, when immunity is established, will destroy the specific organisms. It also seems true that the blood immunity is established before the eruptions appear. The phenomenon attending the onset of the disease seems to indicate the action of the toxic substances which suddenly appear in the blood, being set free by the destruction of the organisms; the development of the eruption is probably due to the organisms and proteins which are deposited in the skin being removed from the full action of the immune blood.

From the observations which I have made during the last 15 years on a vast number of cases of small-pox, I am of the opinion that there are two types of severe cases (1) toxic or hæmorrhagic small-pox (2) confluent small-pox in the septic stage; and that there is no doubt about the severity of the toxins in the pre-eruptive stage, and also that this stage is sometimes prolonged in many cases up to the 5th or 6th day (suppressed type of cases) and the organisms which are thrown out in the skin in the ordinary cases and produce eruption on the third day, remain in the system to produce profound toxæmia and internal and external hæmorrhages. Similar conditions are observed in other toxic exanthemata like scarlet fever and measles. As very good results are reported from the injection of serum from the convalescents in these diseases, I thought at one time, that if a potent serum for small-pox is available in this stage in sufficient quantity, there would be great many chances of neutralising the toxins and modifying the course of the disease; but so far, none has been produced and the results are unsatisfactory.

In the year 1924, 25 toxic cases of small-pox were treated with injections of 10 to 20 c.c. of convalescent serum from the recovered small-pox cases. Every patient whose blood was taken had a severe attack of small-pox, and was convalescent in the third week of the illness. I am thankful to Col. Mackie, the then Director of the Haffkine Institute, who helped me in getting all these bloods tested for the Wassermann reaction and in preparing serum in sterile ampoules. The immediate effect of these injections was good in bringing down the temperature and making the patient comfortable. It is very difficult to say whether the response was specific or due to protein reactions; but on the whole, results were not encouraging, the mortality being nearly the same as that in the control cases. Probably the discouraging results might be due to small quantities of serum which were not enough to supply large amount of anti-toxin which was essential to neutralise all the toxins in the body. It was a constant difficulty to get large amount of serum from the type of patients which are admitted in the hospitals as their health and vitality are invariably low.

In confluent small-pox, if the toxæmia is great and if the patient gets over it, he becomes worse again when the stage of suppuration begins on the 7th or 8th day and succumbs to septicæmia. The infecting organisms, in the majority of cases, are staphylococci but in some cases streptococci are also found. In 1925, I tried specific treatment with vaccines and sera which, in my opinion, sometimes avert suppuration and mitigate many of its effects and helps the patient towards recovery. In the vesicular stage, prophylactic doses of combined staphylococcus vaccine (aureus and albus) were given, first dose of 500 millions on the fifth day, and 2nd dose

of 1000 millions on the 7th day, according to the reaction. These did not have much influence on the subsequent course of the disease and the incidence of septicæmia and pyæmia was the same. Later on during the course of septic stage 20 c.c. of anti-staphylococcus or anti-streptococcus serum were given daily according to the infecting organisms found in the smears from pustules. This had definite influence on the temperature and the symptoms of sepsis, which were lessened ending in the recovery of the patient.

During 1926, I used staphylococcus bacteriophage in nine cases. Severe cases of staphylococcal septicæmia were injected with staphylococcus bacteriophage which Dr. D'Herelle was kind enough to prepare. Out of these 6 died and 3 recovered. The number of cases treated in this manner is not large enough to pronounce an opinion about the utility of the bacteriophage, still the response does not seem to be very satisfactory.

In the year 1929, I treated a few cases with large amounts of convalescent serum. This time 20 to 30 c.c. serum was used at a time and was repeated as needed. But the response was poor as there was neither shortening of the period for cure nor modification of any signs or symptoms.

The following are some of the cases which were treated and their response in detail:—

Case No. I. Patient P. K., male, aged 35, vaccinated, admitted with usual symptoms of small-pox with the hæmorrhagic rash. 25 c.c. of convalescent serum was injected intramuscularly; next day Hemoplastin was injected and convalescent serum was repeated on the fifth day. After the 2nd injection the temperature which was increasing daily was checked and it began to fall. During all these days, he had difficulty in swallowing which cleared up subsequently. Then he got boils all over the body which cleared up on injection of stock staphylococcal vaccine. Afterwards œdema of the legs appeared and the urine showed albumin. He improved later on and was discharged cured.

Case No. II. Patient S. H., female, aged 20, unvaccinated, was admitted with the usual symptoms of small-pox, confluent in type. 25 c.c. of convalescent serum was injected and was repeated on the 4th day. The patient was keeping irregular temperature; the rash became septic and septic blebs were opened up. The rash began to dry up on the face, but she developed abscess on the left leg and after 4 days another on the back. 4 injections of staphylococcal vaccine were given. Temperature dropped slowly and the patient recovered and was discharged cured.

Case No. III. Patient E. F., female, aged 22, vaccinated, was admitted in the hospital with the usual symptoms of smallpox with hæmorrhagic rash, hyperpyrexia and vomiting. Convalescent serum was injected intramuscularly and the patient became much quieter after the injections and was able to take nourishment. Vomiting ceased and the temperature came down a little. She had epistaxis and bleeding from the gums. On the 3rd day convalescent serum was given again and on the 4th day Hemoplastin was injected as there was continuous bleeding from the mouth. She was unable to take nourishment. Condition became worse and pulse became quick and irregular. Stools were dark and watery and at last she expired.

In order to carry out further investigations in the matter we resumed our work in the year 1933 when there was in Bombay a very severe epidemic of small-pox, total admissions in the Arthur Road Hospitals being 2160. The following is the result of the work done in collaboration with Major Growel, I.M.S.:—

1. 20 selected cases of small-pox (partly hæmorrhagic and partly confluent) were treated with injections of the serum obtained from the cows used for preparing vaccince at Belgaum. The results were poor as can be seen. Out of 20 cases who received this treatment 15 expired showing mortality of 75%. 20 cases were treated as a control out of which 14 expired showing the mortality of 70%.

2. Dr. Dhaygaude, of K. E. M. Hospital, conjointly with the staff of this hospital also worked here during this epidemic to see if any improvement could be obtained from the serum treatment. As sheep also get pox disease, he tried to produce small-pox in one sheep by scarification on the abdomen with vesicular and pustular material from severe cases of small-pox. In another sheep 1 c.c. of the vesicular material was injected intravenously. The

first sheep was observed for a period of 3 weeks and rectal temperature was taken to note the febrile disturbances. The scarified areas showed erythematous areola lasting for 6 to 7 days. No pustules were observed. The second sheep showed no febrile disturbances. In one sheep he tried to introduce infection through the nose by spraying the material from vesicles and pustules, but without any effect. Two cases of small-pox (hæmorrhagic type) were treated with the serum obtained from these sheep, immunized against variola but both expired.

3. 25 cases of small-pox (severe type) were treated with blood serum from the convalescent patients who had severe confluent small-pox. Sera were, of course, tested for specific disease and cultural sterility. 20 cases expired showing mortality of 80%.

The foregoing results do not show any superiority of serum treatment of small-pox over ordinary treatment. In conclusion, the efficacy of the serum of immunised animals and the convalescent serum in controlling and modifying the various stages of the small-pox disease and reducing the mortality is doubtful.

4. But Yaoi in the *Japanese Journal of Experimental Medicine*, says: "In a monkey thus previously infected with a variola virus, if injected with the antiviral serums intramuscularly while it is developing papules or vesicules, the eruptions are so influenced as never to proceed beyond the pustule stage, and quick drying and falling off of scabs set in and the eruption clears up completely. The quick disappearance of disease symptoms, recovery of the well-being and appetite and an increase in body weight are evident."

5. De (*Jour. Ind. Med. Assoc.*, August, 1936, pp. 670-77) also reports some favourable results from serum treatment in some cases of small-pox.

A STUDY ON ENZYMES WITH SPECIAL REFERENCE TO AN AMYLASE LOCALLY ISOLATED

AMULYARATAN CHAKRAVARTI, B.Sc., M.B. (Cal.), M.R.C.P. (Edin.),
Hony. Consulting Biochemist, B. I. Research Laboratories, Calcutta

Enzymes are organic catalysts found in the living matter. Some act within the living cells (endo-enzymes) while others are found in the cellular secretions (exo-enzymes). The principal character of the living matter is "change", and normally in certain definite ways. Enzymes have also been found to induce certain changes responsible for the maintenance of life, not only in elaborating the specific needs out of the complex food products available to the life but also contributing to their utilisation for actual growth. By the property of their reversible reaction it may fairly be assumed that the enzymes may also help elimination of certain things not needed. The study of plant chemistry shows remarkable evidence of enzyme activity, the ripening of fruits and the conversion of poly-saccharides to simple mono-sugars are only a few striking examples.

In order to discuss the various problems in connection with the nature, properties and reactions of the enzymes it is worthwhile mentioning, very briefly, certain chemical and physico-chemical facts:

(1) Chemical changes are accompanied, very often, by electrolytic dissociation but electrolytic dissociation does not necessarily precede or cause them.

(2) The relation of the H-ion concentration is often a determining factor in a particular chemical reaction and the properties of solvent and the solute may be controlled by its variation.

(3) All forces, chemical, colloido-chemical or physical, are essentially electrical in nature—the attraction and repulsion between the electrons and positive nuclei. "The chemistry of the colloids is admittedly chemical and no separate laws govern them."—Langmuir.[1]

(4) In biology the unit is the cell, which contains within it a vital nucleus and in the mass of hyaloplasm there are numerous other bodies, distinct and varied, each having its own function and all are concerned in the anabolism and catabolism going on resulting in the life process and growth. There is continuous exchange of materials, *via* the covering membrane, a selective filter in type, governed by the thermo-dynamic principles and a 'membrane equilibrium' commensurate with the needs and requirements of the living cell.

(5) The laws of 'Mass Action' state that the amount of substance undergoing change in a unit time is proportional to the active mass present during that time.

(6) 'The velocity of a chemical reaction' generally obeys the kinetic laws and depends largely on the possible interacting affinity.

(7) 'Temperature' of the medium is an important factor and there is always a certain range in which the velocity of a particular chemical recation is maximum.

(8) 'Concentration' of the substance in solution is another important item and as reaction in solution is continuous the equilibrium constant is obtainable in either direction.

Thus a chemical reaction may be modified by a variety of conditions, *e.g.*, temperature, presence of a positive catalyst, laws of surface action, etc. The first step in a chemical reaction is the formation of an addition-compound, which may react further to form different products. It is possible that while the total composition remains the same, different equilibria may be attained at different stages yielding different products, thus:—

(1) $2NH_3 + 2HCl + PtCl_4 \rightarrow 2NH_4Cl + PtCl_4$
" $(NH_3)_2 + PtCl_4 + 2HCl$
" $H_2PtCl_6 + 2NH_3$

Reaction is possible in either directions.

A catalyst is a substance which in a way takes part in a chemical reaction but whose chemical composition is unchanged as a result of the reaction. As,

$NH_3 + HCl + H_2O = NH_4Cl + H_2O$, here, H_2O may be called a catalyst. Again, (2) $MnO_2 + 4HCl = MnCl_2 + 2H_2O + Cl_2 = MnO_2 + 4HCl$. A catalyst increases the velocity of a particular reaction. It may form intermediate products as in (2), forming and releasing and thus expediting the ultimate reaction. Here HCl alone when heated would have given out Cl_2 but MnO_2 as a catalyst definitely accelerates the reaction.

Properties

An enzyme is a biological catalyst and obeys all the above laws that govern a chemical catalyst. They have, however, some special properties, physical and chemical. If cane sugar is kept in solution even at the ordinary temperature, slow changes occur.

$$\underset{\text{Sucrose}}{C_{12}H_{22}O_{11}} + H_2O \rightarrow \underset{\text{Glucose}}{C_6H_{12}O_6} + \underset{\text{Fructose}}{C_6H_{12}O_6}$$

The hydrolytic change will, however, occur very slowly. If a drop or two of HCl or H_2SO_4 is added to the solution, the velocity of change will be accelerated and the amount of change is thus proportional to the degree of ionisation or the H-ion concentration.

In the hydrolytic change of sucrose, (i) the increase in the H-ion concentration increases the rate of hydrolysis but not quantitatively, (ii) the increase of temperature increases the velocity, 2 or 3 fold for every 10° rise and (iii) the addition of an electrolyte such as a neutral salt, as NaCl, in the acid solution further increases the rate of reaction.

An enzyme *sucrase*, if added under suitable pH and temperature, would induce this hydrolytic change more quickly and effectively. In the process of hydrolysis the H-ions play a great part, but with esters the OH-ions behave equally well, if not better as the reacting factor. According to Stieglitz[2] the reacting ion is the deciding factor in a catalytic action.

The enzymic activities mostly involve hydrolytic reactions. In nature we find remarkable changes, metabolic and catabolic, going on continuously and in many of them the work of the enzymes has been clearly manifested. The changes brought on starch by an enzyme to glucose and its ultimate decomposition to CO_2 and H_2O, although look so simple, involve complex intermediate chemical compounds of yet doubtful chemistry. None have yet been able to give satisfactory evidence of the complete chain of the degradation products of glucose in the living cells.

Special Properties of the Enzymes

1. Enzymes are colloids of high molecular weights.

2. Enzymes act best within certain range of temperature, have always a definite optimum for each and a deviation in either direction definitely inactivates partially or completely.

3. There is always a range of H-ion concentration for each enzyme for its maximum activity and deviation on either side materially affects activity and velocity of the enzyme reaction.

4. Specificity is a special character of most of the enzymes, indicating a close affinity between a particular enzyme and its specific substrate. *Saccharase* hydrolyses sucrose but not maltose. *Amylase* acts on a polysaccharide and not on a disaccharide. Again a yeast enzyme hydrolyses starch to glucose and breaks up glucose to alcohol and CO_2 but the muscle zymase hydrolyses glucose to lactic acid. Further, pancreatic amylase hydrolyses starch to alpha-maltose, while malt amylase to beta-maltose, two different malt sugars with different optical rotation.

5. Enzymes not only accelerate a reaction but determine a direction of the metabolic changes (as stated above under specificity).

6. Reversibility of the reaction is another characteristic and ordinarily equilibrium is attained at any stage.[3]

7. Enzymes ionise in solution and has certain positive or negative charge. They are inactive, if the charge is too large or too small. The condition of the substrate of a particular enzyme-substrate work depend largely on the electric state. Northrop[4] found that pepsin is only active on a positively charged protein and trypsin on a negatively charged. If the proteins are denatured, as when azotized or acetylated so as to alter their nature, pepsin does not act but trypsin acts, possibly due to the electrolytic change.[5]

8. The velocity of an enzyme reaction depends largely on enzyme concentration but equally on the substrate concentration also.

In an enzyme work a definite quantity of enzyme is capable of acting on a definite quantity of substrate. The enzyme loses its identity or exhausts its potency either by combining with any of the products of the reaction or else loses the electric charge by the alteration of the pH. If there is less amount of substrate in the solution and more of the enzyme, there is always evidence of reversible reaction setting in.

9. Certain special features of enzyme activity are evident in the findings that there are:—(a) co-enzymes helping enzyme work, as HCl is a co-enzyme for pepsin; (b) activators, phosphate is an activator for yeast zymase on sugar, (c) kinases, as enterokinase altering trypsinogen to trypsin and (d) complements, as the complement of *amylase* digesting dextrin or amylopectins which purified amylase could not effectively do.

10. Purified enzymes are extremely sensitive biological bodies, easily susceptible to physical changes. Even at the ordinary temperature enzymes in solution remarkably lose their activity. This is specially to be remembered where liquid preparations of enzymes are concerned. One must use some protective substance against such autolysis or inhibition. Alteration of the pH in the solution is of course a great important factor and hence enzymes in solution must need be buffered against possible alteration of the pH. Some of the enzymes are heat-stable but many lose potency by the change of temperature. Potency may be revived fully when raised from a lowered temperature to the active limit but when at a higher temperature, the first thing to lose is the property of reversible reaction and then the loss of specific reactivity. Dried enzymes are, as a rule, more heat stable.

11. Ultra-violet irradiation often destroys activation and does this more in dilute solutions. Certain lights have striking effects on certain enzymes. Red and blue produce activation, while green and violet definitely affect adversely. Sun-light at first produces acceleration but soon there is retardation.[6]

Some of the dyes also have selective action on the enzymes. They are generally inactive in the dark but in the presence of the sun-light there is distinct retarding effect.

12. An enzyme may be inactivated during the course of a reaction by—

(i) heat, evolving during catalysis;

(ii) H_2O_2, if set free or evolved as by paroxidases from H_2O;

(iii) any of the products of reaction, either by materially altering the pH or by forming addition-compound with the enzyme.

(iv) some heavy metals as Ag. or Hg. and acids as HNO_3 act as poisons on enzymes.[7]

From the above facts the following deductions may be assumed:

(i) Falling off of the substrate concentration may lead to lowering of the velocity of the reaction.

(ii) Reversible union of a part of the enzyme with the products of the reaction affects the enzyme activity.

(iii) Irreversible change of the enzyme molecule by any of the products of the reaction lower the enzyme concentration.

(iv) Change of the pH alters the activity and may even devitalise the enzyme.

(v) Change of the temperature during the process of activation produces loss of potency.

Extraction and Purification of the Enzymes

Extraction and purification of the enzymes are matters of great difficulty and there is no one process good enough for many. Sometimes the process is too elaborate and tedious while the yield is poor, again the enzymes may definitely deteriorate in potency while passing through the several stages of purification. Being colloidal bodies adsorbants of different types are generally utilised for extraction and then eluted by suitable solvents. Purification from watery extracts by alcohol of varied concentration is adopted for some of the enzymes, specially where alcohol does not prove to be an inactivator. Solubility of the different enzymes is an important factor in the choice of the method for extraction and purification. Various reagents such as tannin (for peroxidases) or sufranin (for proteases) have also been used for purification.

Adsorbants have specific characters and have to be used accordingly. The pH and the electric charge

are determining factors in adsorption. Elution may be effected either by the change of the pH or by specific eluents. Kaolin adsorbs basic or electro-positive groups, aluminium hydroxide acidic or electro-negative groups and substances amphoteric in type do not react or combine nor form precipitates with ions of either group.[8] The diastase preparation as supplied by the B. I. Co. Ltd., for instance, cannot be dealt with directly by kaolin or aluminium hydroxide but in a solution of alcohol it could be adsorbed by the latter.

A Few Instances of the Specificity of the Adsorbants

Enzyme	*Reaction*	*Adsorbants*
Lipase	Marked acid properties	Aluminium Hydroxide
Trypsin	Strong Base	Kaolin
Bi-diastase	Acidic	Al. Hydroxide after adjustment of pH
Peroxidase	Basic	Tannin or Kaolin

Chemistry of Enzymes

The chemistry of the enzymes is yet uncertain, as purified enzymes of stable activity is rarely obtainable and hence results have been varied and at times conflicting and doubtful. While the greatest worker Willstatter[9] failed to identify them as proteins, Sherman[10] and his co-workers had obtained positive protein reactions. Euler's[11] work was more comprehensive and from analysis a large number of amino-acids were identified. The recent Japanese work[12] on diastase definitely states that the previous findings were possibly due to impurities and that the purified enzyme was neither a protein nor a polypeptide.

Urease has some protein characteristics but it is neither a colloid nor is built up of amino-acids.

Almost all enzymes are non-dialysable and contain C, H, O and N and some P and Fe. Many workers have, however, found that most of the enzymes, when purified by repeated adsorption and elution or precipitation and solution, would lose 25-50% of their activity and hence some believed that the active enzyme was a colloido-chemical substance of loose combination, which ionise and during purification there was some ionisation and possible loss of some of the components.[13] (Northrop).

Study of the nature of the different enzyme work gives us some idea regarding the chemistry of the enzymes. The behaviour of peroxidase, catalase, amylase, reductase indicates aldehyde type of action. Combination of sufranin with trypsin, erepsin, pepsin and papain indicate their acidic nature. The peculiarities in the ionisation of the proteins and their behaviours in different H-ion concentrations remarkably suggest some clear analogy to the chemical nature of at least some of the enzymes. The specificity of the enzymes suggest the different chemical structure of the different enzymes. The union of the enzymes and the substrate clearly indicates that there is an open linkage in the molecule of every enzyme. Both Michaelis[14] and Northrop[15] have found that the enzyme, when ionised in solution behaved with their substrates merely by diffusion and combine in definite chemical relationship. The acid salts of proteins were quickly acted on by pepsin and alkaline salts by trypsin. Maybrach and Euler[16] found that some of the metals formed definite compounds with some of the enzymes and inactivated them more profoundly than others and would indicate a sort of chemical union of the metal with the enzyme or one of its components. An enzyme may thus be assumed to be consisting of a complex molecule showing specific properties due to definite groupings. The possibilities of isomerism, structural, tautomeric or stereo-chemical are so numerous in the various complex organic molecules that simple change of position of the smaller units do not only change the configuration but change the properties also.[17] The character of some of the enzymes of the same class differing only in their regional origin behaving differently would indicate some subtle difference in their chemical configuration. Thus, the 'amyloclastic' power of an amylase indicating the amount of starch to be digested up to a certain point, is quite distinct from the 'saccharogenic power,' showing the amount of maltose formed and again the amylases of vegetable and animal origin show marked difference regarding their relative activity in these directions. We know how the salivary amylase behave differently from the pancreatic amylase not only in the matter of the pH of their activity but also in the specificity of their substrates. Pancreatic amylase hydrolyses starch to alpha-maltose, while malt amylase to beta-maltose.

Again saccharase would hydrolyse sucrose (disaccharide) but never a poly- or a mono-saccharide.[18]

The number of enzymes so far isolated and studied is quite large and their individual characteristics are quite varied too. Although some broad classification have been made as amylolytic, proteolytic, lypolytic, etc., yet in the essential individuality the chemistry must be different and it is vain to expect any general chemical formula for even the general groups. Various workers have been working to this end but yet nothing definite has come out.

From the mass of work done regarding the chemistry of enzymes and nature of their work I would place the following deductions for further consideration.

1. An enzyme molecule will ionise in a solution and only act in a suitable substrate (where combining affinity exists). The substrate molecule will be split up and acted on with the result of production of newer and simpler bodies.

2. Willstatter[19] thought that, an enzyme consisted of a small active group with the linkage of a CO, a COH or even a H or a OH and a large colloidal carrier of definite electric charge and the chemically active factor would combine or act on the substrate and alter the chemistry, the colloid body acting as a simple chemical catalyst.

3. Enzymes always work in a solution. Ionisation is the inherent property of all solutions and the pH indicates the degree of ionisation or the hydrogen potential. Any electrolyte thrown in, would favour more dissociation and the electric charge of the ions would vary. An enzyme itself would ionise in a solution and its charged ions would set up or accelerate the dissociation of a substance already ionised in the solution. There would thus be massing or combination of similar ions and in this splitting and massing it is possible that there would be alteration of the chemical nature of the split bodies and formation of newer substances.

Thus, for instance, starch molecules of the empiric formula $(C_6H_{10}O_5)n$ is insoluble in water, meaning that the molecules have no affinity for water and are heavier. When treated with acid in solution, there is ionisation and the active ions would so modify them that there is splitting of the big molecules to smaller ones, such that although the chemical configuration is yet intact the molecules are no longer so big and heavy (and it is thus how soluble starch is prepared) but if this process is allowed to stay for sometime active chemical change would set in and hydrolysis becomes evident.

An enzyme *amylase* would do exactly what the little acid did but the process would be more prompt and the change quite accelerated. It is quite fair to assume that an enzyme while ionising thus set free some hydrolysing ions capable of initiating this work.

4. A grain of *diastase* is capable of hydrolysing more than 300 times its weight of starch within half an hour under suitable temperature and pH. The enzyme being a colloid body is built up of fairly big molecules which quantitatively could not break up into quite so many molecules to be able to individually act on so many molecules of starch and to act so quickly. Thus the theory of 'union of the enzyme with the substrate' seems physically untenable. Equally improbable is the theory of 'adsorption' for the purpose of activation. Aluminium hydroxide or kaolin would adsorb an enzyme and would be releasing of the same quantitatively by a suitable eluent, there being no alteration in the chemistry of either. A substate may be an eluent as sucrose for *saccharase* but sucrose could not be an adsorbant in the true sense of the term, for saccharase here would initiate change in the substrate. Kaolin (basic) would adsorb trypsin and could be released of it by casein or fibrin for which trypsin has an affinity to activate. An adsorbant is very like a sponge to mop up and release without affecting or being affected. Thus, the phenomenon of adsorption could not be a process for enzyme work.

5. Batteli and Stern[20] (1922) thought that the primary work of an enzyme was to split up H_2O to H and O and set up reduction and oxidation in the substrate already ionised in the solution. Bayliss[21] thought that an enzyme action was due to 'mass action' increasing the active surface of the dispersed substrate molecules. Wieland and Quastel[22] (1926) thought that there was an electric field in the substrate solution of varying strength. An enzyme would ionise and accelarate the migration of the electrons and protons to active centres where they would be either 'hydrogen acceptors' or 'oxygen acceptors' and thus release the bonds in the substrates and develop newer components.

Some Special Characters of the Diastase Locally Isolated

An amylolytic enzyme is being obtained from a special type of fungus (*Aspergillus*) of local origin. Besides diastase there are several other enzymes obtained from the same source, though in very small quantities, such as saccharase, lipase, myozymase, trypsin and a rennin-like enzyme. The activity of these ferments materially inhibit the activity of the main enzyme and during the process of preparation most of these have to be removed or inactivated. There is again a complement along with the glucose-producing amylase capable of activating amylopectins invariably present in all starches. During purification this complement is often lost and hence in a starch solution no pure amylase preparation is capable of hydrolysing the entire poly-amylose unless kept for over 24 hours under proper pH and temperature.

The enzyme is profoundly affected, as all enzymes are, by the presence of its substrate and hence no free starch should be present in the enzyme preparation.

A trace of NaCl would activate the enzyme better and a little of the amino-acid asparagin or glycin has also been found to be useful as an activator. The amylase-complements capable of digesting the amylopectins and dextrins are often destroyed or removed during the process of purification. It acts best in pH 4·5 to 5·5 and if it is left in a pH beyond this range either way, for any length of time the activity steadily diminishes or may be completely lost but the activity may be fairly restored if soon brought back within the range of optimum activity. When kept at altered pH mixed with starch, this restoration of the activity is not evident as the chemistry of the enzyme is materially altered when it comes in contact with its substrate. It has been found that sometimes a thermolabile inhibitor of the type of myozymase is associated with the diastase as a complement capable of hydrolysing glucose to lactic acid and this, if not inactivated by heat or otherwise, would materially alter the pH during the process of digestion and inactivate the enzyme.

Uses and Application of Enzymes

The principal source of supply of enzymes for therapeutic and industrial uses are mostly provided by the vegetable world and amongst them the various species of fungus have supplied the most. (1) The yeast cells produce more than one enzyme of great industrial use: (a) The yeast zymase,[23] converts hexoses to alcohol and CO_2 ; (b) another inverting enzyme[24] would produce glycerine from sugar under suitable conditions and simultaneously acetic aldehyde, which latter on oxidation would give acetic acid or vinegar. The work of Carl Neuberg[25] and Euler[26] in this connection needs special mention regarding the study of fermentation action. (c) In the manufacture of bread[27] the use of yeast enzyme has been utilised to a scientific precision and of great advantage not only in improving the quality but also in the question of economy. (d) Besides these, by the fermentation process many organic acids, alcohols, esters and fusel oils are being manufactured.

2. The behaviour of some of the bacilli, *e.g.*, B. coli, B. typhosus, etc., on different sugars led workers to investigate with promising results as specific enzymes have been detected in some of them.[28] The enzyme-producing *Bacillus aceto-ethylecum* is being utilised for the manufacture of acetone from starch and glucose.

3. Another *Bacillus granulobacter pectinovarum* is being used for the manufacture of acetone and butyl alcohol by fermentation of starch.[29] Extensive studies are going on in this special branch of bacterial enzymes for fermentation process for practical utilisation.

4. Use of certain enzymes for analytical work, such as *urease* for urea estimation, *sucrase* for cane-sugar and beet sugar estimation.

5. Extensive investigations are going on, with some promise, about the use of certain enzymes in the treatment of special types of tumours.[30]

6. Therapeutic use of the various enzyme preparations for some of the common digestive disturbances.

Some Observations on the Therapeutic Use of Enzymes

The following points regarding the use of enzymes are of special interest:—

(1) The optimum temperature of the enzyme activity is near about the body temperature, *i.e.*, 37° to 40°C.

(2) The pH for each enzyme is different for optimum work.

A few are noted here for reference:—

TABLE 1

Salivary amylase	6-6·4
Pancreatic amylase	7
P. D. & Co.'s Liq. Diastase	5-5·6
Liq. Bi-Diastase	4·5-4·8
Malt amylase	4·4
Pepsin	1·5-2·5
Papain	5-7
Rennin from milk	6·1
Rennin from aspergillus	6
Pancreatic trypsin	7·7

While prescribing any enzyme preparations for therapeutic use one should not only know the specific use of an enzyme but should see that it is in the proper form and administered in a suitable medium to ensure its full activity. As already stated, enzymes are highly sensitive organic bodies and could retain their full usefulness only under restricted conditions and while presenting them for therapeutic purposes one needs to know the condition of the alimentary canal, the possible temperature and pH and the contents among which they have to stay and work. The Liquid Bi-Diastase, for instance, would retain its full activity only when kept between pH 4-5, at the ordinary body temperature. Cooling does not inactivate it but prolonged stay above 50°C. would inevitably destroy a part of its activity. As already stated, the activity of an enzyme is profoundly affected by any marked change of the pH, hence it is desirable not to prescribe any enzyme preparation in a mixture, where there is risk of the presence of any of the inactivators (salts of heavy metals, oxidising agents, protein precipitants, nitrites, anilines, specific adsorbants and substrates, glucosides, etc.). Enzymes of the acidic reaction may stand the presence of acids for a while but alkalies are definitely contraindicated. Pepsin or glycerine acid pepsini may go very well in a mixture containing 10-15 m. of HCl dil. but Taka Diastase or a liquid diastase could not exert its full activity in solution of dil. HCl more than 5m in the ounce as will be evident from the following table and the diastatic activity would gradually go down. Diastase preparation being acidic should not be prescribed with alkalies in a mixture but patients may be advised to take some alkalies while diastase is taken as the alkali would bring down the higher pH of the stomach contents to the more suitable pH for diastase to work. In fact, no diastase should be prescribed soon after a feed as the pH of the stomach after a meal is far too high. Pancreatin too should not go after a feed, as it is basic in type and loses its potency in an acid medium. The best time to prescribe pancreatic preparations is in an empty stomach and preferably along with some alkalies. An acidic enzyme, as diastase if administered, after a meal where the pH is fairly high could only commence to act when by the alkaline regurgitation from the duodenum the acidity is partially neutralised and a suitable pH is available. Pepsin would act very well after a meal but as already stated not pancreatin.

TABLE 2

The average pH of the normal ailmentary tract.

Mouth—Saliva 6-6·8.

Stomach—Resting juice 3-4·5.

After a meal: 1st stage—4-5, 2nd stage—2-3, 3rd stage 3·5-4·5.

Small Intestine—Duodenum 7-7·5, Jejunum 7·5-8·5.

Large Intestine—6-7.

TABLE 3

1. The pH of Calcutta tap water—7·0-7·2.

2. The pH of Distilled water (freshly prepared)—6·5.

3. The pH of Bi-Diastase ʒi + Tap water up to ʒi—6·2.

4. The pH of Acid Hydrochlor dil. five minims + Bi-Diastase one dram with aqua up to one ounce —3·6.

5. Acid Hydrochlor dil. mx, Bi-Diastase one dram with aqua up to one ounce—2·5.

6. Bi-Diastase one dram, Soda bi-carb. grs. x with aqua up to one ounce—7·2.

TABLE 4

Digestion in different combinations.

1. Starch solution 5% 100 c.c., Liq. Bi-Diastase ½ c.c. or 2 mgm. of powdered Diastase, pH 4-5: Liquefaction complete in ½ hour, full conversion to sugar complete in 24 hours.

2. Starch Solution 25 c.c., Acid Hydrochlor dil. ½ c.c., Liq. Diastase ½ c.c.—pH 3.

Practically no digestion within 24 hours.

3. Ditto, if the acidity is neutralised or buffered.

Digestion same as in 1.

4. Starch Solution 1% 25 c.c., Milk protein 25 c.c., Liq. Bi-Diastase ½ c.c., N/10 HCl 1 c.c. —pH 3·8.

No starch digestion, precipitation of casein; biuret positive.

5. Starch Solution 1% 25 c.c., Fat free milk 25 c.c., Diastase powder 50 mgm., Pepsin powder 20 mgm.—pH 4·2.

Partial digestion within half hour for both. Digestion complete after 24 hours.

6. No. 5+1 c.c. normal HCl—pH 2.

No starch digestion. Protein digestion complete. Biuret negative.

7. No. 5+1 c.c. normal NaOH—pH 8.

After I hour starch digestion becomes evident; iodine gives brown colour due to dextrins but no protein digestion and biuret is positive.

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AN ENQUIRY INTO CORRELATIONS BETWEEN AGE AND CEPHALIC BREADTH, AGE AND BIZYGOMATIC BREADTH, CEPHALIC BREADTH AND BIZYGOMATIC BREADTH OF THE PEOPLE OF BENGAL

BHUPENDRA NATH DATTA, A.M. (Brown), DR. PHIL. (Hamburg).

In this paper the correlations between age and cephalic breadth, age and bizygomatic breadth, bizygomatic breadth and cephalic breadth of the population of Bengal are enquired into. With this object in view, 169 male subjects from Bengalee-speaking people have been taken as the objects of enquiry. The subjects are chosen from nineteen districts of Bengal. Only two subjects are taken from outside of Bengal, but they are Bengalee-speaking persons, only staying outside as colonists. The districts in question here are as follows: Rangpur, Faridpur, Pabna, Rajshahi, Mymensingh, Dacca, Tippera, Bankura, Khulna, Jessore, Chittagong, Murshidabad, Assam (colonist), Malda, Noakhali, Bakharganj, Burdwan, Manbhum (formerly a part of Bengal but now included in Bihar), Hooghly.

As regards the religion of these subjects, they are to be divided as the adherents of Hinduism, Islam and the so-called tribal religions. Regarding the latter nomenclature, it is to be said here, that the Sontals and the Garos for want of proper designations, may be called as the believers of tribal religions of their own; while the Hajong caste or tribe from which a subject has been chosen, nowadays claims to belong to the ancient Kshatriya *varna*, though as yet it is not regarded as a "clean" Hindu caste. The same is the case with the Koch or the Rajbansi. Besides these, the Sontals examined here, and the solitary Garo subject mentioned in this paper, belong to the province of Bengal and speak the Bengalee language as well.

Regarding the castes of these subjects, besides the Moslems and the followers of the tribal religions, they are distributed amongst twenty-seven Hindu castes, *viz.*, Rajbansi (Koch), Kayastha, Tili, Brahman, Namasudra, Rishi (Muchi), Vaidya, Mahishya, Sadgop, Sutradhar, Napit, Subarnabanik, Bagdi, Gandhabanik, Moyra, Kalu, Tantubay, Bhuiya, Kora, Chatri (Rajput), Bauri, Khairya, Bedia, Tamli, Rajak, Samanto, Hajong. These include both the higher "clean" castes as well as the "unclean" or so-called "depressed" castes.

Thus, these castes as well as the non-Hindu groups mentioned above, form together in total, thirty social groups living in the province of Bengal. Hence, these subjects can be called as good samples of the people of Bengal.

The subjects discussed in these papers have been measured by me, and out of these somatological data, I am using the following here: age, cephalic breadth and bizygomatic breadth with the object of enquiring about any possible correlation between (1) age and cephalic breadth, (2) age and bizygomatic breadth and (3) cephalic breadth and bizygomatic breadth of these subjects. The range of variation of the age of the subjects in question here extends from 19 to 50 years. The range of variation of the cephalic breadth is from 12·7 cm. to 16·1 cm. The range of variation of bizygomatic breadth is from 11·8 cm. to 15·0 cm.

While making an enquiry into possible correlations of 169 subjects the data worked out give the following results:

TABLE 1

	Mean	Standard Error	Standard Deviation	Standard Error	Coefficient of variation	Standard Error
(*a*) Age	31·7159	±0·6074	7·8960	±0·5118	24·8960	±1·5105
(*b*) Cephalic breadth ...	14·3663	±0·4416	0·5742	±0·0037	3·9969	±0·2587
(*c*) Bizygomatic breadth ...	13·1255	±0·4101	0·5331	±0·0035	4·0616	±0·2629

TABLE II.

	Correlation Coefficient	Standard Error
(*a*) Age *multiplied by* cephalic breadth	−0·1516	+0·0751
(*b*) Age *multiplied by* bizygomatic breadth ...	+0·1139	+0·0760
(*c*) Cephalic breadth *multiplied by* bizygomatic breadth	+0·3041	+0·0698

TABLE III.

	Mean	Standard Error	Standard Deviation	Standard Error	Coefficient variation	Standard Error
(1) Age	26·0792	±0·3258	3·274	±0·2302	12·5536	±0·8956
(2) Cephalic breadth ...	14·4356	±0·558	0·5610	±0·0394	3·8850	±0·2738
(3) Bizygomatic breadth ...	13·0960	±0·483	0·4860	±0·0342	3·7099	±0·2614

TABLE IV

	Correlation Coefficient	Standard Error
(1) Age *multiplied by* cephalic breadth	0·0324	± 0·0964
(2) Age *multiplied by* bizygomatic breadth ...	0·2478	± 0·0904

Table I shows that the cephalic breadth is closely related amongst the subjects in question here, as is shown in the smallness of standard deviation and co-efficient of variation.

Likewise the bizygomatic breadth shows close relation with each other. On the other hand, age shows a high number in standard deviation and in co-efficient of variation. This may be due to the wide distribution of age.

Table II shows that there is just appreciable negative correlation between age and cephalic breadth; there is no correlation between age and bizygomatic breadth. Again, there is positive correlation between cephalic breadth and bizygomatic breadth.

Again, when from some of the groups of subjects only 101 persons are taken for our enquiry and in that case the range of age extends from 19 to 32 years, the results as shown in table III are obtained:

In table III the smallness of the standard deviation and of the co-efficient of variation of cephalic breadth, again show that in this matter also the subjects are closely related. The same is the case in the matter of bizygomatic breadth.

Table IV shows that there is no correlation between age and cephalic breadth and there is positive correlation between age and bizygomatic breadth.

From Table II we read that with the increase of age, the cephalic breadth decreases and bizygomatic breadth remains constant. Whereas from Table IV we read that with the increase of age bizygomatic breadth increases, but cephalic breadth remains constant. Again, from Table II, we find that with the change of cephalic breadth, bizygomatic breadth changes also.

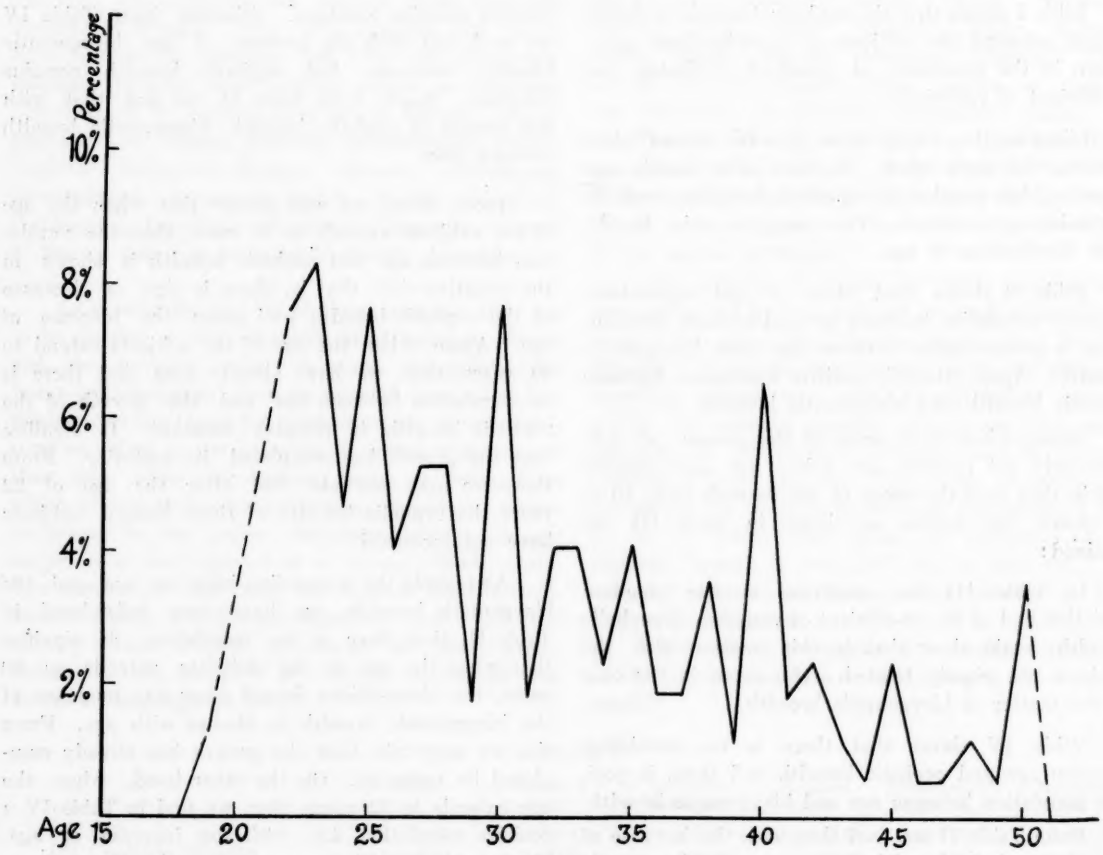
From these, we may gather that when the age of the subjects extends to 50 years, then the correlation between age and cephalic breadth is shown in the negative side, that is, there is sign of decrease of the cephalic breadth *pari passu* the increase of age. Again, when the age of the subjects extend to 32 years, then we have already seen that there is no correlation between age and the growth of the cephalic breadth, it remains constant. It signifies that the growth has completed its maturity. From these we may conclude that after the age of 32 years the cephalic breadth of these Bengal subjects have not increased.

As regards the connection between age and the bizygomatic breadth, we have seen beforehand in Table II, that there is no correlation. It signifies that when the age of the subjects extends to 50 years, the observations do not show any tendency of the bizygomatic breadth to change with age. From this we may take that the growth has already completed its maturity. On the other hand, when the age extends to 32 years, then we find in Table IV a positive correlation, *i.e.*, with the increase of age, bizygomatic breadth increases as well. From these,

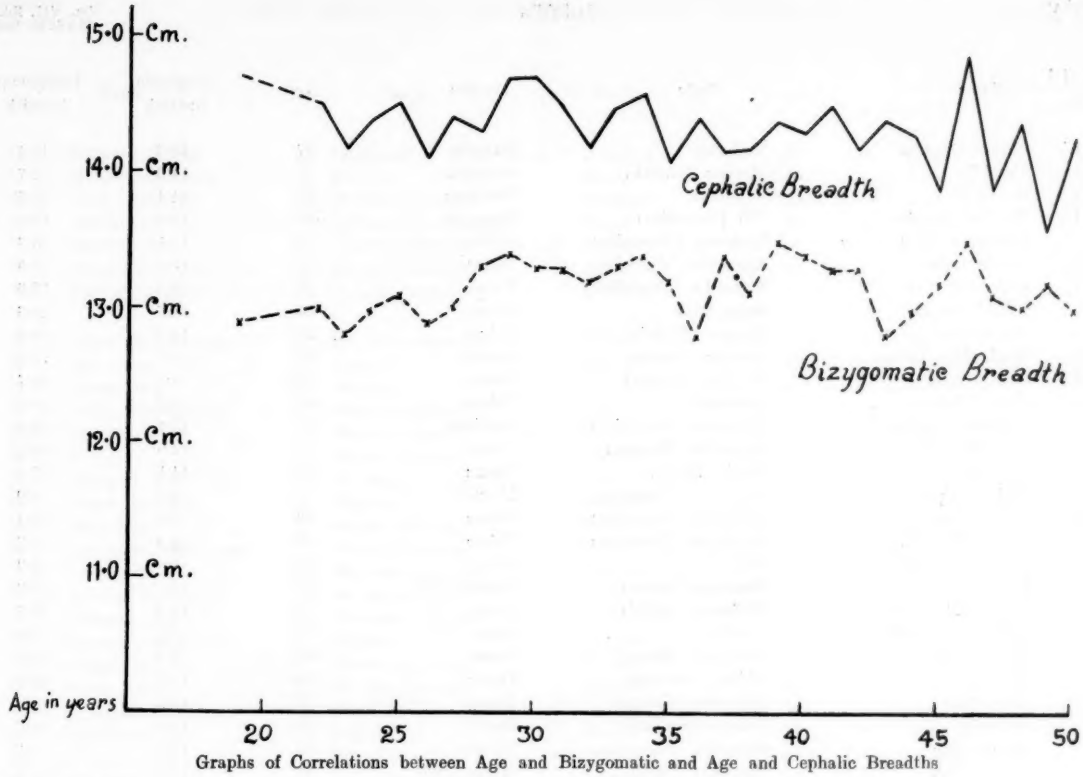
we may gather, that after 32 years of age, the bizygomatic breadth of these Bengal subjects have not increased.

As regards the question of relation between cephalic breadth and bizygomatic breadth, we have already seen in Table II that, when the age of the subjects extends to 50 years, both the breadths are positively correlated. That signifies that within this period of age, with the change of the cephalic breadth, the bizygomatic breadth has also changed.

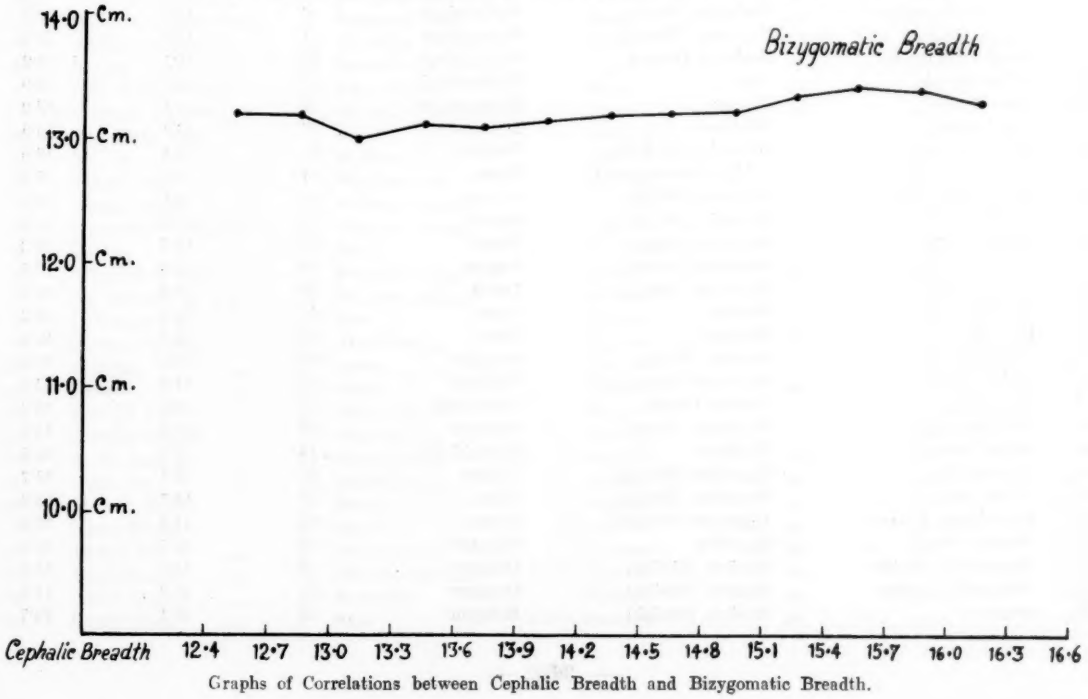
The above-mentioned facts are also to be seen in the adjoined graphical representations.



Graph of distribution of Age



Graphs of Correlations between Age and Bizygomatic and Age and Cephalic Breadths



Graphs of Correlations between Cephalic Breadth and Bizygomatic Breadth.

Serial No.	Name	Caste	District	Age	Cephalic breadth	Bizygomatic breadth
1.	Durlav Barman	Rajbonsi	Rangpur	... 47	13·9	13·1
2.	Ainuddin	Moslem (Sheikh)	Rangpur	... 22	14·3	12·7
3.	Haran Das	Kayastha	Faridpur	... 27	14·1	13·4
4.	Upendra Kundu	Tili (Varendra)	Rangpur	... 26	14·8	13·5
5.	Nagendra Chakravarty ...	Brahman (Varendra)	Pabna	... 33	15·1	13·2
6.	Sachin Raha	Kayastha (Varendra)	Pabna	... 22	15·0	13·5
7.	Kishori Sarkar	Kayastha (Varendra)	Pabna	... 35	14·4	13·0
8.	Behari Mondal	Namasudra	Pabna	... 36	14·7	12·6
9.	Md. Rahim	Moslem (Sheikh)	Pabna	... 25	14·3	12·9
10.	Mohiruddin Sarker ...	Moslem (Sheikh)	Pabna	... 50	14·5	12·9
11.	Md. Munshi	Moslem (Sheikh)	Pabna	... 22	14·1	12·7
12.	Dina Acharya	Brahman	Pabna	... 25	14·7	13·6
13.	Sudhansu Sanyal ...	Brahman (Varendra)	Rajshahi	... 25	15·1	13·0
14.	Kamakhya Dhar	Kayastha (Bangaj)	Pabna	... 23	14·9	12·5
15.	Fulin Das	Rishi (Muchi)	Pabna	... 28	14·5	13·5
16.	Jogin Sarker	Kayastha (Varendra)	Pabna	... 44	14·2	13·0
17.	Kali Biswas	Brahman (Varendra)	Pabna	... 58	15·1	13·4
18.	Suren Chowdhury ...	Brahman (Varendra)	Pabna	... 38	14·2	12·3
19.	Amulya Kundu	Tili	Pabna	... 24	14·9	13·3
20.	Bhavotosh Mukherjee ...	Brahman (Rahri)	Mymensingh	... 26	14·2	13·2
21.	Kalachand Goswami ...	Brahman (Rahri)	Dacca	... 23	14·5	12·5
22.	Khitish Mazumder ...	Vaidya	Dacca	... 42	15·1	13·9
23.	Hemen Ganguly ...	Brahman (Rahri)	Dacca	... 25	14·9	13·0
24.	Arun Roy	Vaidya (Senhati)	Dacca	... 33	14·2	13·3
25.	Jiten Bose	Kayastha (Bangaj)	Dacca	... 35	14·5	13·0
26.	Sailen Sen	Vaidya (Senhati)	Dacca	... 19	14·5	13·0
27.	Hemen Roy	Kayastha (Bangaj)	Tippera	... 30	14·7	13·1
28.	Prokas Das	Kayastha (Bangaj)	Mymensingh	... 23	15·1	13·1
29.	Ramesh Chowdhury ...	Brahman (Rahri)	Mymensingh	... 32	14·6	13·5
30.	Khagen Datta	Kayastha (Bangaj)	Mymensingh	... 24	14·7	13·0
31.	Binod Chakraverty ...	Brahman (Rahri)	Mymensingh	... 30	14·1	13·2
32.	Mahes Morak	Garo	Mymensingh	... 25	13·3	12·8
33.	Kala Chand	Hajong	Mymensingh	... 32	14·1	13·0
34.	Abdul Talukh	Moslem	Mymensingh	... 22	13·7	12·9
35.	Manindra Singha ...	Kayastha (D. Rahri)	Bankura	... 37	14·1	13·6
36.	Suren Sen-Gupta	Vaidya (Bikrampuri)	Dacca	... 37	14·5	12·4
37.	Haranath Banerjea ...	Brahman (Rahri)	Khulna	... 25	15·1	13·5
38.	Jyotirmoy Ghose	Kayastha (D. Rahri)	Jessore	... 24	15·3	13·2
39.	Kalipada Ghattak ...	Brahman (Rahri)	Dacca	... 25	13·7	12·8
40.	Purna Chatterjee	Brahman (Rahri)	Jessore	... 30	14·3	13·7
41.	Rebati Sarkar	Kayastha (Bangaj)	Dacca	... 38	14·2	13·3
42.	Mohabbat Ali	Moslem	Dacca	... 22	14·0	12·9
43.	Hara Roy	Mahisya	Dacca	... 52	14·7	12·6
44.	Pasiruddin Sarker ...	Moslem (Sheikh)	Rungpur	... 38	13·9	13·3
45.	Satish Moitra	Brahman (Varendra)	Rajshahi	... 46	14·9	13·5
46.	Ahmedulla	Moslem (Syed)	Chittagong	... 38	14·3	13·3
47.	Kali Banerjea	Brahman (Rahri)	Rungpur	... 29	15·6	13·8
48.	Radha Biswas	Mahisya	Murshidabad	... 43	14·7	13·0
49.	Upendra Roy	Kayastha (Bangaj)	Tippera	... 38	13·7	12·7
50.	Satish Guha	Kayastha (Bangaj)	Pabna	... 33	14·7	13·3
51.	Chaitannya Acharya ...	Brahman (Acharya)	Pabna	... 30	14·4	13·0
52.	Srinath Ghosh	Kayastha	Rungpur	... 39	14·7	12·9
53.	Manuruddin Sarkar ...	Moslem (Sheikh)	Rungpur	... 40	14·2	12·9
54.	Sahajuddin Sarkar ...	Moslem (Sheikh)	Rungpur	... 24	15·2	14·3
55.	Gangla	Moslem (Sheikh)	Rungpur	... 33	13·4	12·7

Serial No.	Name	Caste	District	Age	Cephalic breadth	Bizygomatic breadth
56.	Srikanta Sarker	Rajbonshi	Rungpur	... 35	14·5	14·1
57.	Mofizuddin Sarker ...	Moslem	Dacca	... 24	14·0	12·6
60.	Jiten Chatterjea	Brahman (Rahri)	Faridpur	... 25	15·0	12·7
61.	Sudhansu Lahiri ...	Brahman (Varendra)	Pabna	... 28	14·4	13·1
62.	Bhabesh Roy	Vaidya (Senhati)	Dacca	... 39	14·1	14·0
63.	Sures Das-Gupta ...	Vaidya (Senhati)	Pabna	... 45	15·4	13·7
64.	Kartabyapriya Gupta ...	Vaidya (Senhati)	Dibrugarh (Colonist in Assam)	27	15·2	13·0
65.	Sudhangsu Chowdhuri ...	Kayastha (Bangaj)	Mymensingh	... 30	14·0	12·6
66.	Bimal Sen	Vaidya	Faridpur	... 23	14·9	13·1
67.	Jamini Roy	Sadgop	Goalando	... 50	15·1	13·0
68.	Sashi Bhattacherjea ...	Brahman (Rahri)	Tippera	... 36	14·7	13·3
69.	Jamiruddin	Moslem (Sheikh)	Rungpur	... 28	14·3	13·4
70.	Nirasa	Moslem (Sheikh)	Rungpur	... 23	14·4	13·4
71.	Surendra Das	Kayastha (Bangaj)	Pabna	... 22	14·5	13·1
72.	Satish Barman	Rajbonsi	Rungpur	... 29	13·9	13·3
73.	Monuddin	Moslem (Sheikh)	Rungpur	... 40	14·1	15·0
74.	Sourendra Sen-Gupta ...	Vaidya (Varendra)	Malda	... 40	14·3	12·5
75.	Sarada Das	Kayastha (Bangaj)	Noakhali	... 40	14·2	13·5
76.	Khirode Mazumder ...	Sutradhar	Pabna	... 40	13·9	14·0
77.	Bhupesh Roy	Kayastha (Bangaj)	Backerganj	... 33	14·3	13·8
78.	Rajendra Barman ...	Rajbonsi	Rungpur	... 36	13·9	12·5
79.	Serajuddin	Moslem (Sheikh)	Rungpur	... 25	14·6	13·4
80.	Umar Ali	Moslem (Sheikh)	Rungpur	... 26	14·7	13·5
81.	Frafullah Das	Kayastha (Bangaj)	Pabna	... 25	14·0	12·6
82.	Ramanath Roy	Rajbonsi	Rungpur	... 27	14·8	13·3
83.	Gourlal Kundu	Tili (Varendra)	Pabna	... 45	14·2	13·5
84.	Nibaran Pal	Kayastha (Bangaj)	Pabna	... 32	14·6	13·1
85.	Raicharan Samaddar ...	Brahman (Rahri)	Backerganj	... 31	14·4	12·9
86.	Krishnalal Mondol ...	Kayastha (Bangaj)	Malda	... 22	14·4	12·2
87.	Basanta Bose	Kayastha (D. Rahri)	Burdwan	... 27	15·5	13·1
88.	Hari Gopal Gupta ...	Vaiya (Rahri)	Malda	... 31	14·1	12·5
89.	Bhabesh Chowdhury ...	Kayastha (Uttar Rahri)	Malda	... 19	14·9	12·7
90.	Bamapada Rana	Napit	Bankura	... 30	14·5	13·0
91.	Md. M. Ali	Moslem (Syed)	Bankura	... 33	14·1	12·9
92.	Jasoda Dey	Subarnabanik	Bankura	... 41	15·5	14·5
93.	Nanda Thakur	Brahman (Gaur)	Bankura	... 22	14·6	13·2
94.	Hanumandas Thakur ...	Brahman (Gaur)	Bankura	... 22	14·2	12·8
95.	Ganesh	Bagdi	Manbhum	... 27	14·7	13·2
96.	Ashutosh Ganguly ...	Brahman (Rahri)	Bankura	... 34	15·8	13·9
97.	Sri Govinda Acharya ...	Brahman (Utkal)	Bankura	... 24	14·4	12·2
98.	Lalbehari Sett	Teli	Bankura	... 50	13·8	12·8
99.	Govinda Mallick	Gandhabanik	Bankura	... 26	14·0	12·2
100.	Bhokku	Sontal	Bankura	... 40	14·5	13·3
101.	Hoffa	Sontal	Bankura	... 30	14·5	13·1
102.	Probhat Dey	Subarnabanik	Bankura	... 27	14·3	13·7
103.	Radhika Chanda	Gandhabanik	Bankura	... 33	14·7	12·7
104.	Rasik Haldar	Gandhabanik	Bankura	... 44	14·3	13·0
105.	Biban De	Subarnabanik	Bankura	... 40	14·5	13·5
106.	Abinash Modak	Moyra	Bankura	... 27	14·2	13·0
107.	Surya Modak	Moyra	Bankura	... 42	13·2	11·8
108.	Ajodya De	Subarnabanik	Bankura	... 53	14·1	14·0
109.	Ashu Ganguly	Brahman (Rahri)	Bankura	... 23	13·8	12·8
110.	Rohini Singha	Kayastha	Bankura	... 27	14·2	12·9
111.	Rajani Gorai	Kalu	Bankura	... 26	13·5	12·8

Serial No.	Name	Caste	District	Age	Cephalic breadth	Bizygomatic breadth
112.	Sricharan	Tantubaya	Bankura	49	13·7	13·2
113.	Guhiram De	Subarnabanik	Bankura	30	14·5	13·7
114.	Marha	Bhuiya	Bankura	24	13·1	12·9
115.	Jatindra Mallick	Gandhabanik	Bankura	24	13·1	12·9
116.	Nemai	Kora	Bankura	32	15·0	14·6
117.	Saiva	Sontal	Bankura	40	14·1	13·0
118.	Tas'choo Daboly Babu ...	Chatri	Bankura	50	13·4	13·0
119.	Manhi	Sontal	Bankura	60	13·7	14·2
120.	Brojo	Bhumij	Bankura	34	12·9	13·1
121.	Keshab	Kora	Bankura	35	13·6	13·3
122.	Man Govinda Babu ...	Chatri	Bankura	42	14·2	14·4
123.	Dinu	Bauri	Bankura	60	14·7	14·1
124.	Surendra Mukherjee ...	Brahman (Rahri)	Bankura	23	13·7	11·9
125.	Potal	Sontal	Bankura	28	14·0	13·9
126.	Mongal	Sontal	Bankura	28	14·6	13·4
127.	Mahes	Sontal	Bankura	30	16·1	13·5
128.	Fagur	Sontal	Bankura	35	14·1	13·1
129.	Babulal	Sontal	Bankura	32	14·6	13·1
130.	Thokra	Sontal	Bankura	50	14·2	14·9
131.	Teen	Sontal	Bankura	35	14·4	12·9
132.	Choonarow	Sontal	Bankura	65	13·7	13·1
133.	Kawee	Sontal	Bankura	32	14·1	13·7
134.	Brindaban Singha ...	Chatri	Bankura	75	14·4	14·4
135.	Surendra Ganguli ...	Brahman (Rahri)	Bankura	42	14·3	13·0
136.	Atul Chand	Gandhabanik	Bankura	23	14·7	13·7
137.	Fitam	Sontal	Bankura	37	14·0	13·2
138.	Mofizuddin	Moslem (Sheikh)	Bankura	28	13·9	12·9
139.	Ramdas Chakraverty ...	Brahman (Rahri)	Bankura	48	14·7	13·2
140.	Sarat Chatterjee	Brahman (Rahri)	Bankura	22	15·2	13·7
141.	Sailen Ghosh	Kayastha	Burdwan	34	15·4	13·5
142.	Sudhir Ghosh	Kayastha	Bankura	30	15·6	14·2
143.	Nakul Pal	Teli	Bankura	22	14·5	13·1
144.	Biroja Mukherjee	Brahman (Rahri)	Bankura	25	14·5	12·9
145.	Joyram Nandy	Moyra	Bankura	22	15·4	14·0
146.	Kalicharan Das	Tantubai	Bankura	45	13·1	12·3
147.	Satish Roy	Khairya	Bankura	25	14·5	12·6
148.	Charu Sen	Kayastha (D. Rahri)	Bankura	43	14·0	12·6
149.	Bepin Sarkar	Kayastha (D. Rahri)	Bankura	50	14·5	12·6
150.	Bhuban	Bauri	Bankura	23	13·7	13·1
151.	Jogindra	Bauri	Bankura	23	14·0	12·7
152.	Thakurdas	Sontal	Bankura	55	13·9	11·3
153.	Prafulla Mallick	Kayastha (D. Rahri)	Bankura	28	14·3	13·0
154.	Tincori Dutta	Kayastha (D. Rahri)	Bankura	40	14·9	13·4
155.	Rampada Gorai	Kalu	Bankura	35	13·4	12·9
156.	Kuwl Bera	Bedia	Bankura	28	13·7	13·1
157.	Bhikari	Bedia	Bankura	27	13·7	12·0
158.	Biren Ghosh	Kayastha (D. Rahri)	Burdwan	41	14·2	12·3
159.	Bonamali	Bauri	Bankura	45	12·7	13·3
160.	Kalu Ghosh	Kayastha (D. Rahri)	Burdwan	71	14·2	12·9
161.	Nripen Ghosh	Kayastha (D. Rahri)	Burdwan	32	13·7	12·5
162.	Probodh Dutta	Tamli	Bankura	40	14·2	12·0
163.	Ganes	Bauri	Bankura	23	14·2	13·2
164.	Frankrishna Pramanik ...	Napit	Bankura	41	13·7	13·0
165.	Gori	Bauri	Bankura	23	13·1	12·5
166.	Jyotish	Rajak	Bankura	26	13·7	12·3
167.	Jadu Sen-Gupta	Vaidya	Bankura	48	14·1	12·8
168.	Ratan Roy	Samanta	Bankura	26	14·0	12·8
169.	Sadai Roy	Samanta	Bankura	30	14·8	13·3

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THE SILVER JUBILEE

The new year, has had, for India, a most auspicious beginning. Two outstanding events occurred, in both of which, Calcutta figured as the venue of operations. Indian scientists assembled from India's distant corners to welcome foreign scientists and delegates from all parts of the globe and sat down to celebrate the Silver Jubilee Session of the Indian Science Congress Association in happy consort with the British Association: Indian cricketers tested their skill with Tennyson's team and forced the latter to come out second best. All honour to those who strive, all honour to those who win.

A hectic week of festivities and feeding, feeding of brain and the grosser man passed off smoothly and Calcutta endeavoured to give of its best to one and all who arrived for the big event. The programme was so heavy and exacting, the inspired audience so enthusiastic and gay, that many visitors felt it more like an Indian *mela* than a scientific gathering. This is a matter for congratulation, because the atmosphere of the lecture gallery is not the ideal one to infuse joy and festival-spirit.

Any attempt to assess the value of this Jubilee session would savour like the attempt to paint the lily, or to gild refined gold: We shall only mention the medical aspect very briefly.

The first comment that was made by the medical representatives from India was that the overseas delegation was not strongly represented by the first-line of medical researchers from distant Europe and America. Institutes of international fame like Pasteur Institute of Paris, Mayo Clinic of America, the Medical Research Council of Great Britain and similar bodies of Central Europe, Russia, and Japan were not represented by any of their leading workers. Professor Straub of Munich, probably the greatest living experimental Pharmacologist was the most conspicuous among our foreign guests in his isolated eminence in Calcutta. One of us was privileged to be associated with him for a while in 1922 when he was adorning the chair of experimental medicine at Freiburg, and we are proud to testify to his warm-hearted welcome to keen and competent seekers of knowledge from India in his branch of work. It is hoped that once every year some one from India will seek to be his disciple at Munich and imbibe the latest in his laboratory researches. Indigenous drugs would form the most useful channel of mutual collaboration.

Medical science apart, the so-called exact sciences attracted many of her most precious votaries and the simple friendliness and warm affection which some of them spontaneously radiated was most remarkable. The President, Sir James Jeans was perhaps the most conspicuous example of the above finding among many Indian students, who had approached with fear and trembling, with their hearts leaping into their mouths, so to say, to exchange a

few words of cordial greeting. Students when brought face to face with their scientific *gurus* marvelled at finding that they were not in so-called august company—distant and formal—but among friends who were just senior students.

Finally, science and its pursuit, however comprehensive and exhausting, do not tend to complicate the nature of those who devote their lives to it—but on the other hand tend to make their natures simple as a child's and their outlook full of hope, joy and optimism. The Mayor of Calcutta in a happy speech deplored the fact that science was being put to very base use in modern warfare, and suggested to Sir James Jeans whether it would not be possible, in the future, to refuse science-culture to unworthy people. The Mayor recalled the fact that in ancient India, unworthy people were strictly debarred from the study of high philosophy and abstruse spiritual teachings. The President desired the Mayor to suggest to Western Scientists how a man could be detected, in his student-days, as one who would put science to base utility later in life. And so ended an event unique in the annals of scientific India, which sets the seal of brotherhood and comradeship between scientific and cultural India and the rest of the world.

ALL-INDIA EDUCATIONAL CONFERENCE

Old Calcutta has shed a bit of her past glory: she no longer revels in being the seat of the Imperial Government and the political capital of India. Nevertheless, Rev. C. F. Andrews and other world-figures have proclaimed that Calcutta can well claim to be the intellectual metropolis of Asia. It was therefore fit and proper that Calcutta was honoured by the task of welcoming the Indian and foreign delegates to the above Conference during the recent cold weather, and the Senate Hall was selected for their deliberations.

It would seem rather presumptuous to attempt an analysis of the very valuable work that was done: the problems are vast, almost infinite, and the weapons few and perhaps rusty: but stout hearts will overcome all obstacles.

The Conference opened with the address of Sir Nilratan Sircar as Chairman of the Reception Committee. He made a shrewd and accurate diagnosis of the ills that affect education and the correct remedies that are indicated. The learned doctor warned his audience, and through them, the whole of the Indian intelligentia, that in the Temple of Learning, communalism is trying to creep in. Religion being largely a private, personal matter affecting the soul of an individual in relation to his Deity, it need not and it should not seek to encroach upon the broad avenues of intellectualism. There is room in the Temple of Learning for all creeds and faiths and religions: if the votaries all worship peacefully, harmoniously and according to their own faiths, and do not seek to demarcate their respective selfish places, the social and intellectual life of the nation will expand to its fullest degree. Sir Nilratan deplored the fact that the State has not, as yet, attempted to introduce free and compulsory primary education to one and all, ostensibly due to lack of funds! He most emphatically protested that if money could be found to engage a huge army of "Law and Order" troops, for special purposes, money to finance costly buildings and new Imperial cities, money must be found for this—the most urgent and imperative need of mankind in the modern civilized age—the provision of free primary education to every son and daughter of India. This is long overdue and brooks no delay.

The Presidential address by Mr. C. R. Reddi, Vice-Chancellor of the Andhra University, is a sub-line of medical researches from distant Europe and to the criticisms levelled against the present system of education observed, " To say that the Educational system is a failure, is, at best, a partial truth, and, generally speaking, worse than an untruth. On analysis it may mean that Society itself is a failure and not its educational organisation, which is one amongst the many factors that mould the character of the younger generation." He expressed satisfaction that the Wardha Educational Scheme has been modified in a large measure. He concluded by saying that intellectual leadership could not flourish without nationalism. It is the University that can supply intellectual leadership. To attempt to retard University expansion in any way would be nothing but national suicide. Poet Rabindra Nath Tagore was prevented by ill-health from gracing the occasion but his stirring message made a wide appeal and found a warm corner in the hearts of his audience. The Poet said," It may be my bias as

an artist, but education seems to be essentially an art—whose problems we solve, not by discussing systems but by discovering creative sources of inspiration. When this source is a human one, it dwells in a teacher who is ever a student, and therefore through whom a perennial intellectual eagerness acts as a dynamic force. Those who have garnered for good their stock-in-trade as school masters and shut their minds against the growing harvest of truth, can only reproduce their lessons as gramophone records. They burden the mind but seldom nourish it."

The above message is specially apt in the case of teachers in medical schools and colleges and we shall, in all humility, conclude by drawing the attention of all present and prospective teachers in all the medical schools of India to this distilled wisdom in the Poet's message.

CASE NOTES

AN UNUSUAL CASE OF DERMAL LEISHMANIASIS OF THE TONGUE

GANAPATI PANJA, M.B. (Cal.), D.B. (Lond.),

Assistant Professor of Bacteriology, School of Tropical Medicine, Calcutta.

Fifteen years ago in 1922 Sir U. N. Brahmachari first described the condition. Since then many cases of various forms have been seen and described by several workers. But none has described nodular lesions in the tongue caused by Leishmania donovani. Napier and Das Gupta (1930, 1934) have mentioned about cases showing lesions on mucous membranes of hard palate, cheek and lips, but no lesions on the tongue. Smith and Halder (1935) have described shallow ulcers on the dorsum of tongue in a case of dermal leishmaniasis but it is doubtful whether these ulcers were caused by the parasite of kala-azar, as no L. D. bodies could be found in the smears from the ulcers and the ulcers healed up in a few days without any antimony treatment.

Dermal Leishmaniasis of the Tongue.

The present case, a Hindoo male, aged 46, of Dinajpur was suffering from dermal leishmaniasis for 8 years. He had K. A. 10 years ago and was treated with 13 injections of urea stibamine. He had lesions on the face, ears, nose, lips, arms, trunk, scrotum, etc. Dark complexion of the man was almost entirely changed to a fair colour; a few bits of original colour of the skin were left here and there. There was a diffuse reddish thickening of his fingers, the dorsum of which showed transverse grooves and a corrugated appearance very much like leprosy and the palms showed a hyperkeratotic condition associated with scaliness. Besides all these, he had nodular lesions on the dorsum of his tongue without any ulceration. These nodules developed only 4 to 5 months ago. On a microscopical examination of smears from the nodules, L. D. bodies were found. The patient had no subjective symptoms and his general health was good.

Treatment

The patient was prescribed weekly intravenous injections of solusalvarsan 2 c.c. each until 3, 0·2 gm. of neostibosan intravenously twice a week for 8 weeks, a trichlor acetic acid (1 in 1) paint on the nodules to be followed by application of borovaseline ointment and internally Lugol's iodine 20 drops with milk twice a day and calcium with parathyroid. About 3½ months later, the patient's tongue lesions disappeared altogether and the lesions on other parts of the body improved considerably. Depigmentation subsided to a large extent. Introduction of pentavalent arsenic by me in the treatment of dermal

leishmaniasis is purely on empirical grounds, though with some sense in it. Treatment with antimonial compounds alone or along with large doses of potassium iodide have failed to cure many cases though a considerable improvement has always followed. Napier has mentioned about refractory cases in whom intravenous antimonial compounds, antimony ionisation, large doses of pot. iodide and even x-ray exposures have failed to produce any beneficial result. Smith and Halder have seen no improvement in purely depigmented lesions under treatment with antimony, and locally with trichlor acetic acid paint, liniment iodine, psoralea oil and barberine ointment. I have treated nodular cases with neostibosan, entodon (Bayer), CO_2 snow, x-rays, trichlor acetic acid, Vienna paste, iodides, but after apparent cure, relapses have occurred in some cases. Additional treatment with injection of arsenic has practically shown that cure is hastened and perhaps made permanent. By this combined treatment, purely depigmented lesions and refractory nodular cases have been cured. Arsenic stimulates metabolism, improves circulation of the skin and probably carries antimony along with it to the skin and renders L. D. parasites sensitive to antimony. We know that arsenic is carried to the skin when parenterally introduced into the body but we do not know whether antimony reaches the skin when given alone or along with arsenic. If arsenic helps to carry antimony to the skin, then the beneficial effect of arsenic treatment is explained. Arsenic and antimony may be injected on the same day or on alternate days. Besides arsenic some cases of depigmented lesions do need vigorous rubbing with psoralea oil and multiple intradermal injections of highly diluted psoralea oil with creosote to stimulate the pigmentation.

I hope my fellow practitioners will try arsenic along with antimony and iodide in cases of dermal leishmaniasis. I must emphasise at the same time that arsenic alone will not cure the condition.

FUSO-SPIROCHÆTAL AFFECTIONS OF GUMS AND LIPS

GANAPATI PANJA, M.B. (Cal.), D.B. (Lond.),

Assistant Professor of Bacteriology, School of Tropical Medicine, Calcutta

Fuso-Spirochætosis Of Gums

Fuso-spirochætosis of gums (Syn. Necrotic gingivitis, Trench mouth) is not uncommon. It is seen in both sexes and is not confined to *pan*-eaters or smokers. I have come across several cases. The attack usually commences suddenly with redness, swelling, superficial ulceration at the gum-margin and formation of pseudomembranes which disappear quickly if the mouth is cleansed. It is for this reason that membranes may not be seen in all cases. Ulceration may be extensive and may not be confined to the gums alone. Usually ulcers are present on inner surfaces of lips and on the under surface of the tongue. In one case, there were many ulcers all over the mucous membrane of the mouth and the whole palate was entirely involved presenting a raw and ham-coloured appearance. Gums become spongy and extremely tender and bleeding takes place. It is exceedingly difficult for a patient to take any solid food. Pus comes out from the gum-margins on pressure. There is always an offensive odour to the breath and this gives a clue to diagnosis. Salivation is sometimes a marked symptom. Temperature goes up from 102° to 103° F. and malaise is present. Glands in the neck get enlarged and occasionally exanthemata appear on the skin. On examination of the pus from gum-margins, fusiform bacilli and spirochætes in large numbers are found. Scanty bacilli other than these are also found. Gingivitis characterised by redness, swelling, superficial ulceration and presence of fusiform bacilli and spirochætes was reproduced in guineapigs and rabbits by a local inoculation with the pus.

The disease is characteristically liable to relapses. One case came to me in his 15th attack.

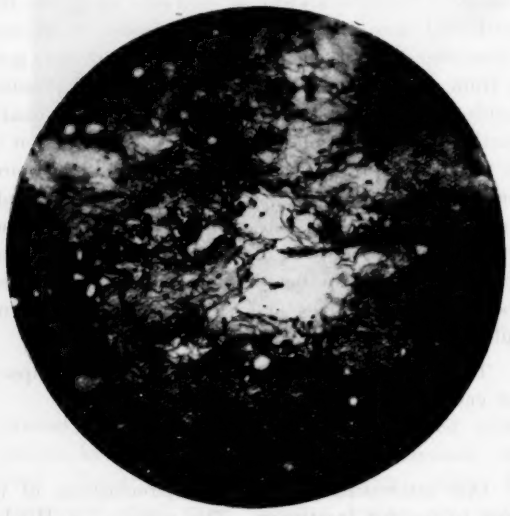
Fuso-spirochætosis of Lip

One interesting case of fuso-spirochætosis of lip came to me for treatment. The patient, a Hindoo widow, aged 50, had a greyish thick adherent scab on

the inner side of her lower lip of five days' duration.

Fusospirochaetosis of the Gums and Lips.

At first sight, it looked like a primary chancre but on closer examination it was found that there was no induration in the lip and the patient was in great pain. She had fever, burning sensation and excessive salivation. No enlarged glands were palpable in the neck. On slightly lifting up the scab a foul-smelling ulcer covered with pus was visible. Examination of a smear of pus showed numerous fusiform bacilli and a few spirochætes. No treponema pallidum was seen by a dark ground illumination.



Section showing numerous fusiform bacilli and a few spirochaetes.

Treatment of Fusospirochætosis

As fusiform bacilli are anærobic organisms, a gargle with hydrogen peroxide or pot. permanganate or sodium perborate is highly efficacious. Albray strongly recommends a saturated solution of sodium perborate for gargle. The drug readily liberates oxygen on coming in contact with diseased tissues. Box's treatment consists in using a paint of Churchill's Tinct. of Iodine (iodine 16·5 gms., pot. iodide 3·3 gms. alcohol 70% 100 c.c.) to be immediately followed by application of 35% silver nitrate. Iodide of silver gets precipitated in the diseased tissues. This is followed by a paint, the prescription of which is given below and then the mouth is rinsed with warm water.

℞

Calc. carb. precip.	ʒ ii
Calc. phosph. precip.	ʒ ii
Sodii perborate	ʒ iv
Sodii oleate (neutral)	ʒ ii
Saccharin	gr. ½
Ol. gaultheria	m xx
Ol. Rosæ	m. x
Pulv. Radicis Indis	ʒ ii

To use on a wet brush.

To kill the fusiform bacilli and the spirochætes, arsenic is invaluable. Arsphenamine in glycerine or simply cheaper liq. arsenicalis is highly efficacious. 2% mercurochrome in 10% alcohol is also a valuable paint. Severe cases and those who do not respond to local treatment should have intravenous injections of neoarsphenamine or sulpharsphenamine 0·4 to 0·6 gm. either once only or more. Usually one injection is sufficient. Due to arsenic fastness of the organisms sometimes there is no response even after 3 or 4 injections at 4 days' intervals. In such cases neostibosan should be given. Kolner (1930) has reported excellent results with Bismarsen. In children neoarsphenamine should be given intra-

muscularly at the beginning, as painting with liq. arsenicalis may be dangerous and may not be possible. Along with all these lines of treatment, a possibility of vitamin C deficiency must be thought of. Hence it is always advisable to give orange and tomato juices.

It may be mentioned here that in mercurial and scorbutic gingivitis, local application of arsphenamine is good. I have given local ultraviolet exposures in some obstinate cases along with the routine treatment and the result has been highly satisfactory. The present case of fusospirochætosis of lip had a gargle with hydrogen peroxide and a piece of cotton soaked in saturated solution of sodium perborate was applied to the necrotic lesion at frequent intervals. One injection of neoarsphenamine 0·3 gms. was given intravenously and the disease cleared up in a few days.

CURRENT MEDICAL LITERATURE

MEDICINE

Early Diagnosis Of Pulmonary Tuberculosis

Marshall (*British Medical Journal*, December 4, 1937, page 1103) deals with the subject under 3 headings, *viz.*, (1) early symptoms, (2) early complications, and (3) investigations. Early symptoms include those of general toxæmic nature, *viz.*, fatigue, loss of morning appetite, loss of weight, amenorrhœa in women and symptoms of neurasthenia or nervous breakdown and those of specific nature, *viz.*, cough, expectoration, night sweats and hæmoptysis. "There is one symptom which in absence of all other evidence is in itself diagnostic and that is free hæmoptysis out of the blue." Early complications are sterile pleural effusion in absence of evidence of malignant disease and pre-anal fistula. Investigations include repeated examination of the sputum (if necessary after potassium iodide or ammonium carbonate), x-ray examination and diurnal record of mouth temperature taken for at least 3 minutes. The author notes that various tuberculin tests and different blood examinations (*e.g.*, Arneth count, Von Bonsdorff nuclear count, lymphocyte-monocyte ratio, S. R. test) are of very little diagnostic value though the latter may help much in prognosis.

The Action Of Theophylline With Ethylenediamine On Intrathecal And Venous Pressure And On Bronchial Obstruction

Greene and others (*Journal of American Medical Association*, November 20, 1937, page 1712) observe that the intravenous administration of theophylline with ethylenediamine (euphylline) causes a definite decline in both venous and intrathecal pressures in cases of cardiac failure with concomitant relief of dyspnœa or restoration of regular rhythm in Cheyne-Stoke's breathing. They further observe that the drug has also a favourable action on bronchial obstruction both in cases of bronchial asthma and cardiac failure.

A New Syndrome Apparently Due To Over-Activity Of The Posterior Pituitary

Jones (*Lancet*, January 1, 1938, page 11) reports a case characterized by hyperchromic anæmia, hypertension and abnormal carbohydrate tolerance and whose urine contained a substance or substances resembling the action of posterior pituitary extract, *viz.*, pressor action (in cat), antidiuretic action (in rat) and melanosome-dispersing action (in frog). All these suggest the possible presence of hyperfunction of the posterior pituitary. It was further observed that with the clinical improvement of the case there was definite diminution of the pituitrin-like substance excreted in the urine. This is undoubtedly a new clinical syndrome.

Complications Of Peptic Ulcer And Their Treatment

Kruse (*Journal of American Medical Association*, September 11, 1937, page 869) points that the most common complications of peptic ulcer are intractability, hæmorrhage, alkalosis, obstruction, hypersecretion and perforation. Intractable ulcers require surgical treatment only when they do not yield to medical treatment and when all foci of infection and nervous manifestations have been dealt with without much improvement. The treatment of hæmorrhage from ulcers is medical in the early stage and consists of absolute bed-rest with morphine, administration of adequate fluids, gastric lavage in presence of remnants of food or blood, alkalies and small transfusions of blood, but when these fail surgical intervention is essential. Alkalosis is treated by stopping of alkalies, no fluid or food by mouth and normal saline by hypodermoclysis and glucose intravenously, gastric lavage, the administration of 300 c.c. of 2% solution of ammonium chloride per rectum and neutral or insoluble alkalies in presence of even a slight degree of renal disease. Obstruction is often relieved by a return to the first part of the ulcer regime but when not improved must be treated

surgically. Hypersecretion often accompanies obstruction and should be managed accordingly. Treatment of perforation in peptic ulcer is surgical.

Angina Pectoris

Hochrein (*Medizinische Klinik*, October 15, 1937, page 1385) lays particular stress on the fact that the treatment of angina pectoris should be individualised and directed to deal with the patient's personal peculiarities and extracardiac conditions in the gastro-intestinal tract and in septic foci in addition to the pathological lesion, *viz.*, the coronary insufficiency, as is evidenced from his own observations that coronary occlusion occurs without pain in 40% cases and only about 15% of the patients with calcified coronary arteries report angina. He further notes that it must be decided if the angina is due to coronary insufficiency of organic basis or to vasomotor insufficiency. Nitrites have been given up by him as they are found to produce stupor, vertigo, reactive hyper-excitability and a "nitrite" habit. Adrenalin though dilates the coronary arteries raises the aortic pressures and thus increases the demands on the heart. The author advises caffeine and barbiturates in slight cases and administration of intravenous glucose (20 c.c. of 30% solution) daily and calcium gluconate or lacarnol in more severe cases. Sometimes very good results have been obtained by inhalation of 4 to 5% carbon dioxide or short wave irradiation of the heart. The treatment of the hyperexcitability of the nervous system though important is very difficult and comprises amongst other such measures as psychotherapy, the use of bromides and barbiturates, hydrotherapy, massage etc.

Intermittent Venous Occlusion In The Treatment Of Peripheral Vascular Disease

Colleus and Willensky (*Journal of American Medical Association*, December 25, 1937, page 2125) report on their observations on the effect of intermittent venous occlusion in 124 cases of peripheral vascular disease consisting amongst others 27 cases of thromboangitis obliterans, 33 cases of non-diabetic vascular sclerosis, and 48 cases of diabetic vascular sclerosis. The beneficial effect of this method of treatment is due to the fact that the temporary interruption of the venous return results in increasing arterial amplitude (Bier's congestive hyperæmia) and that the release of obstruction is followed by a very pronounced form of reactive hyperæmia (Lewis). There is often complete relief of pain within 48 hours after the treatment is begun. There is always a remarkable increase in the patient's walking capacity, a regeneration of tissues in the shape of healing up of the ulcers, etc., an improvement of nutrition of the nails and growth of hair over areas which had become denuded. It has been further noted that if the surface temperature is raised (by diathermy) during the treatment by intermittent venous occlusion the phenomenon of reactive hyperæmia is accentuated. The combined treatment (occlusion and diathermy) seems to the authors to produce better results.

The important observations made by the authors are that in the non-diabetic group 85% patients were males but in the diabetic group 46% only were males and whereas 24% of the non-diabetic group presented open lesions 71% of the diabetic group was similarly affected, and that some of the failures in the treatment were in the diabetic group (24% of the ulcer and gangrene cases came for amputation and this percentage is certainly lower than the percentage of such cases treated by other methods, *viz.*, 50%).

X-ray Treatment Of Rheumatic Carditis

Lery and Golden (*American Journal of Medical Science*, November, 1937, page 597) in reviewing an analysis of 48 cases of rheumatic carditis treated with x-rays observe that this therapy is of value in rheumatic carditis specially in cases of chronic low-grade infections. 12 died in this series and of 36 cases that survived 25 were markedly improved both clinically and electrocardiographically. The author then dealt with the dose and technique in detail and stressed on these points as careless irradiation may produce harmful effects on the myocardium and the pericardium. The authors note that some of the very bad cases, disabled and confined to bed for prolonged period of time showed signs of improvement after x-ray treatment was begun and several cases with greatly damaged heart improved with the treatment and did not show any signs of active carditis for over ten years.

SURGERY

Intracranial Pressure Without Brain Tumour

Dandy (*Annals of Surgery*, October, 1937, page 492) reports in detail 22 cases with definite symptoms and signs of increased intracranial pressure without an intracranial tumor or space occupying lesion of any kind (the presence of brain tumor has been negatived by ventriculography). The subjective symptoms were nausea, vomiting, double vision and loss of vision in many cases, giddiness and the objective signs were bilateral papillædema and hæmorrhage in the eyeground and increased pressure (measured by ventricular and lumbar punctures). The condition was evanascent in certain cases but persisting and troublesome in others. The C. S. fluid showed with two exceptions cell count and globulin content within normal limits. The cause of this increased pressure is still unknown though various factors producing the condition have been discussed. Complete spontaneous cure may occur. The treatment is a right subtemporal decompression when necessary (*i.e.*, determined by eye grounds and vision) with provision for maximum opening in the subtemporal region.

Prevention Of Pulmonary Embolism

Barnes (*Journal of American Medical Association*, October 23, 1937, page 1347) points out that the full recognition of common danger signs will certainly diminish the incidence of pulmonary embolism which has a very high mortality incidence. He observes that the fatal embolism is often preceded by one or two milder attacks in which the cardinal signs of cyanosis and dyspnœa are absent but shock, vomiting or collapse are present. These latter should serve as danger signal and a syringe containing half a grain of papaverine hydrochloride must be kept ready for intravenous use. Obese patients and specially those with cardiac lesions undergoing serious abdominal operations are most likely to be affected and the emboli usually arise from the thrombosis of the femoral, iliac, or pelvic veins, slowing of the venous circulation precipitating such an attack. Placing of the patient in the Trendelenburg position for the first 24 hours after operation, keeping the legs warm and getting them massaged, inhalation of carbon-dioxide for the first 24 hours and insistence of passive and active movement until the patient is out of bed are some of the measures that are found successful in the Mayo Clinic and these when followed will certainly lower surgical mortality from pulmonary embolism.

Problem Of The Gall-Bladder

Wakely (*Lancet*, December 18, 1937, page 1413) in his review deals with the diagnosis and clinical course of different congenital abnormalities and of acute and chronic cholecystitis. In the operative treatment of the gall-bladder in such conditions he mentions some of the pre and post operative measures which when followed will lower the mortality, make the convalescence rapid and cure the patients. Liberal glucose drinks containing some vitamins for fighting out toxic symptoms, calcium gluconate injections for ensuring coagulation of blood, diathermy pads over hepatic area to relieve congestion if there be any, an ox-bile enema given in the morning before operation to prevent abdominal distension during exploration are some of the important pre-operative measures. The choice of an anæsthetic is an important question and the use of gas and oxygen is quite safe. Avertin can be used in non-toxic cases whereas spinal anæsthesia may be used in others, the injection of Icoral of course counteracting the fall of blood pressure in such cases. The incision must be paramedian and it is wise to drain the common duct with a small rubber T-tube for some days to drain the toxic bile from liver. The post operative measures consist of an enema containing three ounces of bile collected from the T-tube, an ounce of turpentine and an ounce of olive oil added to the ordinary soap water enema given on the day after operation. This is followed by an hepatic purge and a second bile enema 2 days after. Fluids are also given in liberal quantities.

Blood Chemistry In Intestinal Obstruction

Falconer and Lyall (*Lancet*, December, 25, 1937, page 1472) in their study of the blood chemistry in cases of intestinal obstruction observe that the patients fall into two groups, *viz.*, (a) those showing azotæmia, hypochloræmia, alkalosis and dehydration and (b) those showing azotæmia and dehydration with

a normal plasma chloride level and a variable acid-base equilibrium. The first group includes all the pyloric and duodenal obstructions and many obstructions at lower levels and the second group includes cases of obstruction in small and large bowels. There is of course no uniformity characterising the biochemical changes in the blood brought in by obstruction at any given level of the small or large intestine and the only constant finding in cases of obstruction at all levels is the rise in the blood urea content. It is further observed that after relief of obstruction the blood constituents tend to become normal and that the marked benefits often noted after saline administration are due more to the correction of dehydration than of plasma chloride content though greater amount of sodium is necessary in cases of hypochlorræmia.

Malignant Disease Of The Bronchus

Ormerod (*Journal of Laryngology*, November, 1937, page 733) in reporting on the review of 100 consecutive cases diagnosed by histological examination of biopsy materials obtained through the bronchoscope observes that 58 of the growths were on the right side, 42 on the left; 92 of them were males, 8 females; that most of the tumors were soft, pale, irregular and granular but a few were hard and red, that cases of inflammatory disease were more sensitive to bronchoscopic examination than normal persons or those with neoplasms (a point of distinction in differential diagnosis). They further note that more than half were squamous-celled carcinoma, some were adenocarcinoma and the rest showed in section masses of two or more types of columnar, cuboidal, oval or round cells. The treatment is still unsatisfactory as few come at the early stage and the tumors are often in inaccessible position. Unless there is reasonable prospect of complete removal by operation radon treatment should be carried out in all but moribund cases, radons being introduced through the bronchoscope under local anæsthesia. Of the 100 cases 4 were treated by lobectomy all of whom died shortly after, 1 treated by diathermy who lived for 11 months and 67 by radon. Of the last group 1 is alive after 5 years, 1 after 2½ years, 2 after 2 years, 2 after more than 1 year. Of the patients who died one lived for 53 months, one for 27, one for 26 and one for 15 months, and those who lived felt more comfortable by shrinkage of the growth and better aeration of the lung.

OBSTETRICS AND GYNÆCOLOGY

Treatment Of 106 Cases Of Puerperal Fever By Sulphanilamide

Colebrook and others (*Lancet*, December 4, 1937, page 1291) report on the results of treating 106 cases of puerperal sepsis by sulphanilamide usually by mouth alone. Of these cases 100 were of hæmolytic streptococci, 3 of anærobic streptococci and 3 of staphylococci. From the comparative study of the efficacy of sulphanilamide (the present series) and sulphomido-chrysoidin and P. S. (previously reported in 1936) the authors maintain that for a case of very severe infection the intensive combined treatment by the red dyes is advisable whereas for less severe cases treatment with sulphanilamide by mouth alone will be adequate and less expensive. There were 8 deaths in this present series. The mortality rate for all cases infected of hæmolytic streptococci treated since the beginning of 1936 has been 5·5 per cent. as compared with the average of 22·8 per cent. for the preceding five years. Cyanosis occurred in 58 cases and other toxic symptoms observed were prostration, paraæsthesia, headache, visual disturbances and joint pains. "Drug fever" was also suspected in several cases.

Vitamin E In The Treatment Of Habitual Abortion

Currie (*British Medical Journal*, December 8, 1937, page 1218) summarises the results of treatment of 37 cases of habitual abortion with vitamin E, only those cases with more than one previous abortion being included. The author notes that these cases between them in 130 pregnancies had given birth to only 16 viable children. Each case was examined for the usual accepted causes of abortion and was given daily one capsule containing three minims of wheat-germ oil from first attendance till term and the result was that these 37 women produced 37 living children, two abortions being balanced by two sets of twins. The author concludes that in vitamin E we now appear to have a means of combating this condition although the doses and

length of treatment is still open to discussion. He, however, mentions that toxæmic symptoms appeared in some of the cases while continuing the treatment.

TROPICAL MEDICINE

Amœbic Dysentery: An Analysis Of The Laboratory Data From 400 Cases

Kampmeir and Hinman (*Journal of Laboratory and Clinical Medicine*, July, 1937, page 985) give an analysis of laboratory data of 400 cases of amœbic dysentery confirmed by presence of E. histolytica in stools or proctoscope materials. Fæces examined in 212 cases showed amœba either in vegetative or in cystic form in 81·2%, proctoscopic examination revealed ulcers in 87·3% and active amœba in 84·3% cases. Hæmatological studies showed a slight anæmia (secondary type) and the analysis of the differential count (done in 103 cases) showed that 73 had a polymorphonuclear ratio of 75% or less, 59 between 56 and 75% and 32 had a relative as well as absolute polynucleosis, 23 having between 76 and 85% and 9 over 85%. The gastric analysis showed achlorhydria in 13 and hypochlorhydria in 25 out of 40 cases examined.

Yatren In Chronic Intestinal Amœbiasis

Chopra and others (*Indian Medical Gazette*, June, 1937, page 348) report on the results of treatment of 50 cases of chronic intestinal amœbiasis with Yatren. The drug is usually given by mouth in 1 gm. doses taken twice daily for ten days (15 days, if necessary). When the sigmoidoscopic examination reveals an ulcer local lavage with 2% solution of Yatren is given in addition. The results obtained are given in the table below:—

E. Histolytica	*Cured* %	*Intermediate* (with favourable prognosis) %	*Failed* %
Cystic form ...	62·9	29·6	7·5
Vegetative form ...	57·9	15·9	26·2

The authors further report that no untoward symptoms occurred in the series except diarrhœa which was rarely troublesome. The result is quite encouraging and they hold that the drug can be safely tried in all cases and it has a special advantage of being useful in cases where carbarsone is contra-indicated.

The Epidemiology Of Leprosy

Lowe (*Leprosy Review*, October, 1937, page 161) deals with the various facts and theories regarding the epidemiology of leprosy in the world and in India. The most important points observed by the author are that (1) leprosy is an infectious disease though not highly so. (2) That children are most susceptible to leprosy though adults are partly or wholly immune. (3) That prevention of contact between infectious cases and children is the best way of controlling leprosy.

The Significance Of Positive Wassermann And Kahn Reactions In Leprosy

Muir and Roy (*Leprosy Review*, January, 1938 page 13) note that in early and slight leprosy cases without any marked constitutional disturbances a persistently strong W. R. or Kahn reaction should be taken as an indication of spirochætal disease whereas in advanced cases specially those with "leprous reaction" a positive reaction without definite clinical signs or positive history should not be taken as diagnostic of syphilis. The authors advise in such cases repeated serological tests to find if they are consistently positive. They report in tabular form their own observations to substantiate the points noted above.

New Trypanocidal Substance

King and others (*Lancet*, December 11, 1937, page 1361) after their investigation of a number of guanidine substances having direct trypanocidal action in experimental animals observe that Synthalin B is one of them and undecane diamedine is the most active member of the series. The drug has a direct lethal effect on the parasite and does not act through hypoglycæmia as was formerly believed to be (trypanosomes require for their metabolism large quantities of sugar). It has been further observed that unlike aromatic arsenicals and Bayer 205 these drugs get very slowly resistant to trypanosomes. This discovery is certainly of great practical significance.

VENEREAL DISEASES AND DERMATOLOGY

Gonococcal Endocarditis

Rowlands and Simpson (*British Journal of Venereal Diseases*, October, 1937, page 215) while reporting six cases of gonococcal ulcerative endocarditis with autopsy findings, observe that gonococcal endocarditis is a rare complication of gonorrhœal urethritis. Stone (1934) found only 77 proven cases and 45 cases of uncertain diagnosis in the whole literature. The rarity is emphasised by the figures of the London Hospital. During twenty-five years (1912-36) out of a total of 405,481 in-patients there were only six cases of gonococcal endocarditis. They classify generalised gonococcal infection into three groups: (a) bacteriæmia, (b) pyæmia and (c) ulcerative endocarditis. They summarised their findings as follows: (1) The absence of a cervical discharge and even negative bacteriological findings of cervical and urethral smears do not exclude the diagnosis in the female. (2) The time relationship of the general symptoms to the onset of urethritis is usually indeterminate in the female, but a matter of weeks and sometimes months in the male. (3) The symptomatology is that of a septicæmia, and abnormal heart sounds may or may not be a prominent feature. (4) The duration of the disease is weeks or months. (5) The condition is nearly always fatal. (6) The general condition and resistance of the patients are probably important factors in the prophylaxis of the condition, and should not be ignored.

The Histopathology Of General Paralysis Of The Insane

Galbraith (*British Journal of Venereal Diseases*, October, 1937, page 242) writes that macroscopical examination shows atrophy of the brain usually restricted to the anterior parts, mostly to the frontal lobes. In chronic cases the meninges may be thickened. Microscopically the meninges may show moderate degrees of cellular infiltration. The nerve cells show various degenerative changes. The more severe changes consist of (1) a general disturbance of the cytoarchitectonic structure with small areas devoid of nerve cells ('dropping out') and even gross destruction of the cortex ('spongy state'); (2) perivascular infiltration of the intracerebral vessels with lymphocytes and plasma cells, giving a 'cuffed' appearance to vessels; (3) a subpial 'felting' of glial fibres and proliferation of the macroglia and microglia with the formation of hypertrophied astrocytes and of Hortega 'rod' cells (4) myeline degeneration—two main types are seen in the cortex: (a) A diffused demyelinisation affecting chiefly the supraradiary and tangential fibres, giving a characteristic 'moth-eaten' appearance to stained specimens, (b) a focal degeneration similar to that found in disseminated sclerosis; (5) changes in the cord similar to those of tabes dorsalis, or subacute combined degeneration or of disseminated sclerosis; (6) ependymal granulations, 'frosting' on the floor of the fourth ventricle are almost invariably found but not in any way specific as is commonly asserted; (7) endarteritis of both cerebral and spinal vessels; (8) gliosis especially in the white matter, increased lipoid content in the nerve cells and also necrobiotic changes are seen in the cornu ammonis of the cerebrum. But they are also commonly seen in many other pathological states.

A histochemical reaction 'the Spatz Iron Reaction' has been found to be positive in all untreated cases. The test consists in receiving small pieces of brain tissue into normal saline and then placing them in conc. ammonium sulphide for ten minutes. They are then washed well in water or saline. A thin portion is then flattened between a slide and a cover slip. With a hand lens the dark-green pigment can be seen in positive cases, with higher magnification the pigment is seen localised in the adventitia of the blood vessels.

Kline Exclusion Test In Prevention Of Transfusion Syphilis

Straus (*Archives of Dermatology and Syphilis*, November, 1937, page 1039) notes that the proper selection of a blood donor necessitates not only tests for compatability of blood and physical examination but also immediately before the transfusion a very sensitive blood test for syphilis to prevent the transmission of this disease. The Kline exclusion slide test is an excellent method for this purpose, even in emergency cases, because of the rapidity, simplicity and ease of its performance and its high degree of sensitivity. This test is very necessary as fifty-nine cases in which syphilis has been transmitted by

donors are already recorded in the literature. The actual number is probably much greater. The author records two cases of professional donors whose slide tests gave positive results, though they were within the established three month period of serological examination.

Eosin In The Local Treatment Of Psoriasis

Gourgerot and Degos (*Bulletin de la Societe francaise de dermatologie et syphiligraphie*, 43, 1936, page 1784) report on the use of alcoholic and aqueous solutions and other preparations of various dyes, such as crystal violet, fuchsin, methyl-thionine chloride (methylene blue) and eosin in the treatment of psoriasis. The most favourable results were obtained with eosin in the following concentrations: 2, 5 and 10 per cent. solutions in water and 1 and 2 per cent. solutions in alcohol, 2 per cent. mixture in petrolatum and 2 per cent. mixture in cold cream.

The lesions were either painted with a 2 per cent. solution of eosin in alcohol every two days and anointed with petrolatum or with a cold cream on the alternate days or treated daily with 2 per cent. eosin in petrolatum or in a cold cream. During the treatment the patients were instructed to bathe two or three times a week, using 125 gm. of sodium carbonate per bath, between applications of eosin. The results were encouraging. The scales disappeared rapidly, and the lesions faded within two weeks. The authors felt that eosin gave results more favourable than those obtained with juniper tar or with salicylic acid and equal to those obtained with chrysarobin. Eosin has no odour and is easily washed off. The local therapy was combined with a fat free diet; the eosin was applied vigorously for several minutes. In the opinion of Gougerot and Degos this method minimised recurrences better than any other treatment. (*Abstract in Archives of Dermatology and Syphilis*, November, 1937, page 1095).

Thiosulphate For Allergic Skin

Wendt (*Deutsche Medizinische Wochenscrift*, December 3, 1937, page 1832) reports that sodium thiosulphate has proved invaluable in certain types of skin sensitization. Dose of 0·3 to 1·0 gm. dissolved in 10 c.c. of distilled water are given intravenously. The author uses a new product, s-hydrial which contains 1·0 gm. of thiosulphate in stable solution. Lesions must be allergic in character: primary lesions will not respond and require usual applications. The intense pruritis is often controlled by the first injection. Bromide acne is relieved while ordinary acne is not. The author has found the therapy highly efficacious in dermatitis herpitiformes, in eczema following seborrhœic dermatitis. Sodium thiosulphate quickly aborts pityriasis rosea which usually runs a definite course of 4 to 6 weeks. The results obtained are quite encouraging and the therapy certainly shortens the period of disability and as such demands further trial.

PEDIATRICS

Chronic Miliary Tuberculosis In Children

Fish (*Archives of Diseases in Childhood*, Vol. 12, No. 67:22) in dealing with the subject reviews the literature, discusses the differential diagnosis and summarises in the following lines his observations on ten cases reported in detail:—

(1) "Miliary tuberculosis runs a chronic course more frequently than is generally recognized; recovery occurs in a fair proportion of these chronic cases.

(2) Recovery is commonest when the nodules are confined to the lungs, but it may also take place in generalized cases and even when the onset of the illness is moderately acute.

(3) The pathology of the lesions in chronic and acute cases is essentially the same.

(4) Healing of individual miliary tubercles takes place by a process of fibrosis which usually leads to their complete disappearance from the pulmonary skiagrams.

(5) Massive caseous glands in the upper mediastinum are a frequent finding in the juvenile type of chronic miliary tuberculosis; the presence of these glands may be responsible for the tendency to recurrent episodes of tuberculous bacillæmia which is a feature of these cases.

(6) Any one of these episodes may give rise to fatal meningitis; the risk of this complication occurring is, however, considerably diminished if strict rest in bed is maintained until the X-ray picture is clear." (*Author's Summary*).

Congenital Hypertrophic Pyloric Stenosis In Infancy

Donovan (*Journal of American Medical Association*, August 21, 1937, page 558) observes that the condition appears in early infancy and is heralded by vomiting which usually does not start abruptly and which though in the early stage is small in amount gradually increases and becomes persistent and never contains any bile. Peristaltic waves are often visible and a palpable tumor is pathognomic of the condition. Preoperative measures such as replacement of fluids with normal saline by hypodermoclysis and small transfusions of blood will produce better results. The operation of choice is that of Fredet-Rammstedt.

Laryngeal Diphtheria And Tracheotomy

Napier (*Lancet*, September 18, 1937, page 5951) reports that there were in the last 11 years 220 cases of laryngeal diphtheria out of total 2,528 cases of diphtheria (8·7%) in the City Glasgow Fever Hospital. Croup was the clinical manifestation in 65% of these cases and additional pharyngeal infection in 34%. Tracheotomy was done in 25% of cases. The mortality rate was lowest (16%) in cases where larynx alone was involved, higher (29%) where fauces were also affected and highest when the infection had spread to the nasopharynx and in the last two conditions tracheotomy was more frequently needed. Treatment of laryngeal diphtheria consists of steam tent, poultices to the neck and chest and stimulants. Serum in doses of 8,000 to 12,000 units is given intramuscularly (large doses often aggravate obstruction by causing too rapid separation of the membrane). In advanced cases tracheotomy is done. The tube is taken out in a week in favourable cases but in older children with laryngeal spasm the tube may be kept for a longer period. 14 fatal cases in the series included 4 of tracheobronchial diphtheria, 4 of bronchopneumonia, and 6 of toxæmia. The value of aspiration of the membrane by a suction apparatus is still open to discussion. The author maintains that tracheotomy produces better results than intubation in the treatment of laryngeal diphtheria.

Cooley's Anæmia (Erythroblastic Or Mediterranean Anæmia)

Mukherjee (*Indian Journal of Pediatrics*, January, 1938, page 1) reviews the literature on the subject and describes a case in detail having all the characteristic features of the disease. The case was a Bengali boy of 30 months suffering from fever and cough for 3 months with enlarged liver and spleen, hypertrophy of the heart, catarrhal inflammation of the lungs, progressive anæmia and leucocytosis with abundance of nucleated red cells and with the following characteristic radiological findings, *viz.*, the rectangular contour of the long bones with ground glass appearance of the medullary canals and the cranial bones showing widening of the diploic space, thinning of the tables specially of the outer and closely packed striations at right angles to the tables giving the appearance as 'hairs standing on end.' This as the author mentions is the first recorded case of Cooley's splenomegalic erythroblastic anæmia on this side of the Suez and shows definitely that the disease may be found even in children of non-Mediterranean parentage.

ASSOCIATION NOTES

Minutes or proceedings of Branches and Affiliated Societies intended for publication should be sent to the Secretary of the I. M. A. at the Headquarters, 67, Dharamtala Street, Calcutta—EDITOR.

BENGAL PROVINCIAL BRANCH

Proceedings of a meeting of the Bengal Provincial Council of the Indian Medical Association held on Monday, the 31st January, 1938, at the Association Hall.

Members present—Dr. Sundari Mohan Das (in the chair), Drs. P. K. Guha, B. N. Ghosh, P. C. Roy, J. C. Banerjea, B. Banerji, K. C. Chaudhuri, S. Mukherji, T. N. Ghosh, A. D. Mukharji, Subodh Datta, Panchanan Chatterji, K. P. Sen, K. K. Sen Gupta (Calcutta); Jibananda Mukherji, Molin Chandra Chatterjee (Howrah); Kali Pada Poi (Khulna); Capt. J. C. De (Chinsurah) and Dr. Gourhari Datta (Ranaghat).

1. The proceedings of the last meeting were read and confirmed.

2. The statement of accounts for the month of December, 1937, was inspected.

3. After some discussions it was unanimously resolved that a sub-committee consisting of the following members be formed to consider the situation created by some members of the Calcutta Branch forming separate branches without the sanction and recognition of the Provincial Council; it was further resolved that the sub-committee be requested to submit its findings before the next meeting of this Council which will be held on Monday. the 14th February, 1938:—

Dr. K. K. Sen Gupta (Convener), Drs. T. N. Ghosh, B. Banerjee, A. D. Mukharji, P. Chatterji, S. Mukherji and P. C. Roy.

4. The letter from Dr. K. Seal, Hooghly, was placed before the meeting and it was resolved that the Register of the High Court be requested to send us a copy of the scheduled rate of fees payable to medical practitioners for attendance in a Court of Law.

5. Dr. Jiban Krishna Ghosh of Andul Mouri (Dist. Howrah) was elected as an additional member of the Bengal Provincial Council for the year 1937-1938.

6. Regarding re-organisation of Darjeeling Branch it was resolved that the Secretary be requested to send a suitable letter to the Civil Surgeon, Darjeeling, with a request to take an active interest in the branch.

7. (a) Resolved that the bill for Rs. 29/8/- for supply of stationery by Messrs. G. Rogers & Co., be paid.

(b) The letter dated 31-1-38 from the Secretary, Journal of the Indian Medical Association re: formation of a new Board of Collaborators, was placed before the meeting and it was resolved that the consideration of the matter be postponed till the next meeting.

(c) Resolved that the Secretary be empowered to fix a date and to devise suitable means for celebrating the eightieth anniversary of our present President, Dr. S. M. Das.

With a vote of thanks to the chair, the meeting terminated.

S. M. DAS, *Chairman.* K. K. SEN GUPTA, *Jt. Hony. Secretary.*

JALPAIGURI BRANCH

SUMMARY OF ANNUAL REPORT

In his report the Secretary apologised for the unavoidable delay in calling the Annual Meeting. He next referred to the sad and untimely death of Dr. Gostha Behari Bhaduri as also to the transfer of Dr. Kabir Hossain, a well-wisher and a foundation member of the Association.

In briefly summarising the year's activities the Secretary dealt with the usefulness of the Association as an instrument in protecting the interests of the entire medical profession. He continued:

"There were altogether 8 meetings of this branch during the last year. There were two seminar meetings, in one of which Dr. C. Sanyal read a paper on some Atypical cases of Malaria and in another Capt. E. G. Montgomery, Civil Surgeon of

Jalpaiguri delivered a lecture on Synthetic Anti-Malarial Drugs. Two meetings, notices of which were issued, could not be held for want of quorum. There were 11 members on the roll at the beginning of the year and 20 new members have been enlisted this year making the total number of members 31 at the end of the year.

"This association after a prolonged and persistent struggle could manage to have a seat in the Managing Committee of the General Hospital, Jalpaiguri, and Dr. Suresh Chandra Sen Gupta, President of this branch was unanimously elected as representative of this branch to the Hospital Managing Committee. Our hearty thanks to Capt. E. G. Montgomery, the then Secretary of the Hospital Managing Committee, for the fair and reasonable attitude he took on this controversial matter.

"Dr. Akshoy Kumar Bhowmik attended the last Bengal Provincial Conference which was held at Calcutta in November last as a delegate and representative of this Branch."

He concluded by expressing his hope that better progress would be achieved during the tenure of his successor in the coming year.

KHURJA MEDICAL ASSOCIATION

An extraordinary meeting of the Association was held on 4-2-38 to express sorrow at the sad demise of Dr. Ramsarupji, L.M.P.

The following resolution was unanimously passed:—

Resolved that the Khurja Medical Association expresses its deep sense of grief at the sad demise of Dr. Ramsarupji, President of the Association and prays to the Almighty to give peace to the departed soul and consolation to the bereaved family.

MAKHAN LAL SINGHAL,
Hony. Secretary.

FEROZEPUR BRANCH

The Annual General meeting of the Ferozepur Branch was held at Dr. Malik's residence at 2 p.m. on the 20th January, 1938, when the following office-bearers were elected for the year 1937-38:

President—Dr. Brij Narain Bhargava, M.B.B.S.
Secretary—Dr. Sadhu Chand Vinyek, M.B.B.S.
Joint Secretary—Dr. Niamat Khan, M.P.L.
Treasurer—Dr. Brij Lal Gupta, M.P.L.

It was unanimously resolved that whereas the members of this District Branch appreciated the interest taken by the local authorties with regard to the health of the school-going children and for steps to improve the hygienic and sanitary conditions of the institutions they record their emphatic protest against allowing the health officer thus appointed to do private practice amongst them The Association was of opinion that thereby the object would not be attained. It was pointed out that in no part of the civilized world a health officer appointed for wholetime work is allowed to undertake private practice. It was decided to issue letters to the Deputy Commissioner, Ferozepore, the Managing Committee of the local institutions, the Secretary, The Punjab Branch of the Indian Medical Association and the members of the Punjab Medical Council.

Resolved unanimously that the account of the Ferozepore Branch of the Indian Medical Association, Ferozepore be operated by the Treasurer in future. This year Dr. Brij Lal Gupta M.P.L. who is elected Treasurer will operate the account.

SADHU CHAND VINYEK,
Hon. Secretary.

TINNEVELLY BRANCH

The ninth Annual Gathering organised by the Association, commenced at 3-30 p.m. on Saturday, the 22nd of January, 1938, at the St. John's College, Palamcottah under the presidentship of Lieut.-Col. T. S. Shastry, I.M.S. Seventy-eight members were present. Five members of the Madura Medical Association, five members of the Travancore Medical Association, three members of the Tuticorin Medical Union, two members of the Independent Medical Practitioners' Association, and one member of the Ramnad District Medical Association, graced the function.

The Secretary read the minutes of the last monthly meeting which were passed.

The election of office-bearers was then proceeded with:—

President—Lieut.-Col. T. S. Shastry, I.M.S.

Vice-President—Dr. T. N. Govinda Iyer, M.B. & C.M.

Secretary & Treasurer—Dr. K. Rama Ayyar, M.B.B.S. (Andhra).

Representative for Women Members—Dr. Mrs. E. Bernard Carr.

Representative for the Rural Medical Practitioners—Dr. K. T. Vengu, L.M.P.

Representative for the General Body—Dr. T. S. Vaikuntaraman, L.M.P., Dr. L. Mahadevan, M.B.B.S. (Madras), D.O.M.S. (London).

Member-Auditor—Dr. K. V. Muthiah Pillai, L.M. & S.

Resolved that the Programme of meetings for the next year will be the same as during 1937.

At 4-30 p.m. the guests were entertained to tea and light refreshments and music. After a group photo at 5-30 p.m. with Rao Bahadur Dr. T. S. Tirumurti, B.A., M.B. & C.M., D.T.M. & H. (London), the function proper began.

Lieut.-Col. T. S. Shastry, I.M.S., the President of the Association offered a hearty welcome to all the members, and guests, and the Chairman of the Annual Reunion in suitable terms. He expressed his thanks to the Representatives of the Medical Profession of the neighbouring State and Districts.

Rao Bahadur Dr. T. S. Tirumurti, B.A., M.B. & C.M., D.T.M. & H. (Lond.), Professor of Pathology, Madras Medical College, opened the proceedings of the Conference as the Chairman of the Reunion.

Resolutions regarding the demise of (1) Dr. K. C. Ananthapadmanabhan of Ettayapuram, (2) Dr. K. Venkatachalam of Vallanad, and (3) Dr. T. S. Ramakrishna Iyer, L.M. & S., Civil Assistant Surgeon, were unanimously passed, having been moved by Lieut.-Col. T. S. Shastry, I.M.S.

Then Dr. T. S. Vaikuntaraman, L.M.P., read the messages of well-wishes for the success of the Conference, received from the following:—

(a) The Hon'ble Dr. T. S. S. Rajan, L.R.C.P. M.R.C.S., Minister-in-charge of Medicine and Public Health, Madras.

(b) The Hon'ble Dr. U. Rama Rau, L.M.P., President, Madras Legislative Council.

(c) Capt. V. D. Nimbkar, F.R.C.S. (Edin.), President, Indian Medical Association, Madras Branch.

(d) Dr. U. Krishna Rau, M.B.B.S., General Secretary, All-India Medical Conference.

(e) Telegram from the Secretary, Trichinopoly District Medical Association.

Lieut.-Col. T. S. Shastry, I.M.S., appealed to the members in aid of the King Emperor's Anti-Tuberculosis Fund. Rao Bahadur Dr. T. S. Tirumurti, reinforced the above appeal.

The Secretary Dr. K. Rama Ayyar, M.B.B.S. presented the Annual Report, which was passed unanimously.

Dr. T. S. Tirumurti, impressed on the doctors their duty to support the indigenous medical products industries, exhorted the Government to encourage the growth of the Chemists and Druggists' Profession by passing a suitable Act of the Legislature to prevent spurious course of Pharmaceutical Chemistry, etc., and by removing the excise duty on alcohol to facilitate and cheapen its use in the preparation of B. P. preparations, etc. He heartily congratulated the Tinnevelly District Medical Association on its multifarious activities like Monthly Health Exhibitions and the Annual Medical Exhibition and on the cultivation of social fellowship with our colleagues outside our District, and repeatedly complimented the Association on its excellent *esprit d' corps*, solidarity, sound finances, and exemplary record of work. Finally, Dr. T. S. Tirumurti, suggested that the local Independent Medical Practitioners' Association and the Tuticorin Medical Union should amalgamate themselves with the Tinnevelly District Medical Association ere long. He also strongly exhorted all practitioners to join and strengthen the Indian Medical Association remembering the advice of the Hon'ble Minister for Public Health of the Madras Government.

The following interesting clinical cases which were successfully treated and operated at the Government Headquarters Hospital, Palamcottah, were read out:—

1. Tumour abdomen (multiple ovarian cysts—malignant) by Dr. Mrs. A. Brown.

2. Tumour left arm (lipoma) by Mrs. A. Brown.

3. Tumours thigh (sarcoma & lipoma) by Dr. P. Janardhana Rao, L.M. & S.

4. Hydro-pyo-nephrosis (tubercle) by P. S. Srinivasan.

5. Intestinal obstruction (volvulus) by Dr. Miss A. Lazarus.

6. Penetrating wound chest—protrusion of lung by Dr. T. K. Nilkanta Iyer.

7. Typhoid fever (repeated bleeding) by Dr. P. Janardhana Rao, L.M. & S.

8. Necrosis tibia (right) by Dr. P. S. Srinivasan.

9. Necrosis fibula (right) by Dr. P. S. Srinivasan.

10. Stone in the bladder with delirium by Dr. T. K. Nilkanta Iyer.

In connection with the above cases, the patients were demonstrated, and specimens were shown to the members.

A discussion on these cases followed, Rao Bahadur Dr. T. S. Tirumurti, and Lieut.-Col. T. S. Shastry, I.M.S., contributing to the discussion and elucidating the pathology and therapeusis of the cases. Then followed at 10 p.m. the Anniversary Banquet. The grand banquet was brought to a happy close late at night after Toasts were proposed and replied to as below:—

The King Emperor—Lieut.-Col. T. S. Shastry, I.M.S.

The Association—Dr. T. N. Govinda Ayyar, M.B. & C.M.

Reply—Rao Bahadur Dr. T. S. Tirumurti, B.A., M.B. & C.M., D.T.M. & H. (London).

The Guests—Lieut.-Col. T. S. Shastry, I.M.S.

Reply—Dr. M. V. Natesan of Madura and Dr. Raman Tampi of Trivandrum.

The adjourned meeting was continued at 11-30 p.m.

The Principal Address of the meeting was delivered by Rao Bahadur Dr. T. S. Tirumurti, B.A., M.B. & C.M., D.T.M. & H. (London), Professor of Pathology, Medical College, Madras, on the subject of "Modern Conception of Pathology of Tuberculosis." This was as expected, most informing, impressive and interesting. He laid stress on (1) the usefulness of lymphoid tissue to arrest the infection, (2) the disease begins in childhood, (3) resistance is developed by small doses of repeated infection in civilised communities, (4) prevention is by open air life, and simple hygienic living, and other infected cases in the home, and sending them to preventoria, (6) the duty of medical men and women to spread the campaign against tuberculosis, to strengthen the "soil" rather than the "seed", and to promote natural immunity by better nutrition, etc. From this point of view he strongly commended the Wardha Scheme of Education.

The meeting ended with a hearty vote of thanks to Dr. T. S. Tirumurti, and to the College Principal, by the Secretary.

Thanks were offered to the members of the Tinnevelly District Medical Association (1) by Dr. M. V. Natesan, on behalf of the Madura Medical Association, (2) Dr. Raman Tampi, M.D., on behalf of the Travancore Medical Association and (3) Rao Sahib Avudaiappa Pillai, B.A., B.L., on behalf of the non-medical public.

In the morning at 11 a.m. a Medical Exhibition was held at the St. John's College Hall, Palamcottah.

K. Rama Ayyar,
Secretary & Treasurer.

HYDERABAD DECCAN BRANCH

At the Annual General Body meeting of the Indian Medical Association, Hyderabad-Deccan Branch, held on 11th February, 1938, the following gentlemen have been elected as office-bearers for the year 1938:—

President—Major K. N. Waghray, M.B., M.R.C.P. (Lond.).

Secretary & Treasurer—Dr. G. S. Melkote, L.M. & S.

Joint Secretaries—Drs. Jayasurya, I.M.D. and Krishna Murthy, L.M. & S.

Members of the Committee—(1) Dr. B. Chandra, M.B.B.S. (Bom.), M.R.C.P., M.R.C.S. (Lond.), (2) Capt. Ranji, M.B.B.S. (Bom.), D.O. (Oxon.). (3) Dr. S. A. Jabbar, M.B.B.S. (Bom.), D.M.R.E. (Eng.). (4) Dr. A. S. Ramachandran, M.B.B.S., D.G.O. (Mad.).

DACCA BRANCH

Proceedings of the Annual General Meeting of the Dacca Branch, held on 8-1-38 in the J. N. Inter. College premises with Dr. S. C. Gupta in the Chair.

Members present:—Dr. S. C. Gupta, Rai Sahib S. C. Ghosh, Drs. S. K. Mitra, C. C. Das Gupta, H. Ganguli, N. Banerjee, B. Banerjee, C. H. De, L. K. Sen Gupta, B. L. Roy, D. N. Seal, M. L. Boral, R. Banik, J. K. Sen Gupta, K. C. Dhar, S. C. Ray, A. Ahmed and P. C. Sen.

(1) Resolved that the Secretary's Report for the year 1936-37 and the audited accounts as read and submitted be passed.

(2) Election of office-bearers for 1937-38 was postponed for a future date.

After a vote of thanks to the Chair the meeting terminated.

ANNUAL REPORT

We have pleasure to submit the annual report of the workings of the Dacca Branch of the Indian Medical Association for the year ended 1937. This meeting was due to be held sometime back but for some unavoidable reasons it could not be held earlier for which we express our sincere regret.

Total number of members ...	... 21
Resignation ...	... nil
Death	... 1
New members enrolled ...	... 2
General meeting ...	... 1
Ordinary meetings ...	... 5
Special meetings ...	... 2
Sub-committee meetings	... 4

The former President of the Branch Rai Bahadur Dr. G. P. Mitra passed away during the year under report which we all deplore. The Branch has lost in him a towering personality and an energetic President May his soul rest in peace.

This branch formed a Sub-committee to consider the question of unemployment amongst the medical profession with special reference to Dacca. The Sub-committee submitted an exhaustive report which was adopted in a general meeting and sent to the Provincial Branch in due course. But we very much regret to say the Provincial Branch did not think it worthwhile to publish it in the Association Journal although it published similar report of other branches.

This branch also after thorough discussion suggested that the Parent Association should lower their quota of subscription or contribute some portion of this quota to Branch Associations who are financially not very sound. This suggestion of our branch also did not find any response from the proper quarters.

It is worthy of note that we have fixed our annual subscription at Rs. 4/- out of which Rs. 3/- goes to the central body leaving only a rupee for this branch. As our number was only 21 we had to balance our budget with a paltry sum, the result is that we cannot afford to have a room for our own where our office can be located or meetings could be held. We are in such a plight that we have not got a bearer of our own to circulate notices and collect subscriptions.

One special feature of our activities this year is that we elected one member to the Reception Committee and two delegates to the Bengal Provincial Medical Conference to represent this Branch.

We are very much indebted to the authorities of the Dacca National Medical Institute for kindly lending a room with some furniture for our office purposes and also to Rai S. N. Bhadra Bahadur, Principal, Jagannath Intermediate College for giving us every facility for holding meetings in his College Hall.

We offer our thanks to our present President and Vice-Presidents who heartily co-operated in our activities and gave us their valued suggestions whenever needed. Our auditor as usual very kindly audited the accounts of 1937 at great personal loss for which we offer our thanks.

We are glad to announce that we have been able to enlist Dr. P. C. Sen, D.P.H., Health Officer and Dr. H. K. Pal, L.M.F., a young practitioner of the city early this year and it is hoped others will join in large numbers and make the Association a living unit.

As 4 members have not yet paid their annual subscriptions although their quota to the central fund has already been sent to the headquarters and delegation fee of a member had to be paid from the reserve fund our balance at the close of the year is what it is. It is hoped the defaulting members will clear their arrears in no time. Subscription of 3 members have been partly realised and the balance

is expected to be realised shortly. This also accounts for the poor balance.

It is hoped that to-day's election of office-bearers for 1938 will find more earnest and energetic secretaries to infuse life to this Branch and make their presence felt thus changing the old order.

* * *

Proceedings of the meeting of the Dacca Branch held on 17-2-38 in the premises of the National Medical Institute at 7 p.m.

Members present—Drs. S. K. Mitra, H. Ganguli, S. C. Ray, Capt. C. C. Das Gupta, Drs. N. Banerjee, J. K. Sen Gupta, D. N. Seal and C. H. De.

Dr. S. K. Mitra was voted to the Chair.

The following office-bearers were elected for the year 1937-38:—

President—Rai Sahib Dr. S. C. Ghosh, L.M.S.

Vice-Presidents—Dr. L. K. Sen Gupta, L.M.F., Dr. P. C. Sen, D.P.H. and Dr. S. K. Mitra, B.SC., M.B. (Cal.), M.R.C.P. (Edin.), D.P.H. (Lond.), etc.

Jt. Secretaries:—Dr. N. Banerjee, M.B. and Dr. S. C. Ray, L.M.F.

Asst. Secretaries—Dr. K. L. Datta, B.SC., M.B. and Dr. H. K. Paul, L.M.F.

Additional members of the Executive Committee—Drs. J. K. Sen Gupta, M.B., M. L. Boral, L.M.P., A. Ahmed, M.B. Capt. C. C. Das Gupta, M.B. Dr. K. C. Dhar, M.B., Dr. D. N. Seal, L.M.F.

Treasurer—Dr. H. C. Ganguli, M.B.

Auditor—Dr. A. K. Gupta, M.B.

After a vote of thanks to the chair the meeting terminated. Light refreshments were served.

N. BANERJEE,
Jt. Hony. Secretary.

MEDICAL NOTES AND NEWS

KING-EMPEROR'S ANTI-TUBERCULOSIS FUND FOR INDIA (BENGAL)

The following is the text of the appeal issued under the signatures of Lord Brabourne and Dr. B. C. Roy in their capacities as the President and Chairman respectively of the King Emperor's Anti-Tuberculosis Fund (Bengal):—

In no province is the campaign against tuberculosis more urgent than in Bengal. A million of our people are suffering form this disease and as many as a lakh die every year. There must be a quarter of a million persons actively spreading the infection and no less than 35,000 children are crippled by tuberculous affections. Tuberculosis is an appalling drain on the health of the people and the only acknowledged and effective method of combating it is to prevent its incidence and its spread.

Her Excellency Lady Linlithgow has appealed and we join in the appeal—"That all persons, rich and poor, should contribute their utmost—much or little—to this great cause, grasping a noble opportunity of united effort to oppose a great evil in India, and to promote the highest welfare of the people."

Do please remember that unless we all exert ourselves to the utmost, it is impossible to safeguard the country and the community against the dangers ahead.

The expenditure incurred in the prevention of tuberculosis is always productive. To subscribe to this cause is to invest rather than to spend—an investment that will bring a rich yield in health and happiness to the present generation and to generations yet unborn. It is in this belief that we ask everyone in Bengal to thrust his hand deep in his pocket and give handsomely to help so urgent a cause.

Donations may be sent to the Honorary Treasurer, King-Emperor's Anti-Tuberculosis Fund (Bengal), the Imperial Bank of India, Calcutta, or to the Honorary Secretaries or may be paid into any office of the Imperial Bank.

Further information may be obtained from the Honorary Secretaries of the Fund at Gillander House, 8, Clive Street, Calcutta, (P. O. Box 174).

SHROFF MEMORIAL GOLD MEDAL

The following subject has been selected by the Bombay Medical Union for competitive thesis for the above Prize for 1938:—

> "Tuberculosis in general, paying special attention to its prevention and treatment."

The award will be in the form of a Gold Medal called the "Dr. B. S. Shroff Memorial Gold Medal" of the Bombay Medical Union.

The competitor must be (i) a duly qualified member of the medical profession holding a degree or degrees and diplomas from Indian and other Universities created by statute, or (ii) a duly qualified member of the medical profession holding the diploma of Membership of College of Physicians and Surgeons of Bombay.

The thesis must be sent in six typed copies so as to reach the Honorary Secretaries, Bombay Medical Union, Blavatsky Lodge Building, French Bridge, Chowpatty, Bombay, on or before the 15th August, 1938. The thesis should be designated by a motto instead of the writer's name and should be accompanied by a sealed cover containing the name of the writer and his Post-Office address. The name of the Prize, the year of competition, the subject of the thesis and the writer's motto should be superscribed on the cover.

No study or essay that has been published in the medical press or elsewhere will be considered eligible for the Prize, and no contribution offered in one year will be accepted in any subsequent year unless it includes evidence of further work.

The accepted thesis shall be the property of the Bombay Medical Union.

THE DOCTOR'S HEART

Articles on the diseases of their profession have a certain fascination for medical readers, particularly if they are well documented with statistical tables. Attention may therefore be drawn to a brief but valuable paper by A. Morris Ginsberg of Kansas City in

the October issue of the *Journal of the Missouri State Medical Association*, entitled "The Doctor's Heart." Heart disease is described as the leading cause of death among physicians practising in the United States of America. Its incidence (40 per cent. of all deaths) is almost double that found in the general population (23·85%). Cerebral hæmorrhage, pneumonia, and arteriosclerosis take second place. Among members of the Jackson County Medical Society (1932-36) heart disease was the cause of 36·2 per cent. of all deaths. Of twenty-one heart deaths eight were due to coronary occlusion, six to coronary sclerosis, five to chronic myocarditis, and two to rheumatic heart disease. Of further interest is a questionary submitted to members of this society. Out of 594 practitioners average age 49·94 years—232 sought medical advice in the last two years, and of these eighty-three have some heart disturbance which in 74·69 per cent. was degenerative in type. Finally a survey of 279 premedical students at the University of Kansas for 1935 and 1936 shows that six are affected with rheumatic heart disease, an incidence of 2·1 per cent. which is comparable to the estimated percentage in the general population. (*B. M. J.*, Dec. 4, 1937, page 1130).

THE GERMAN SUBSTITUTE FOR THE NOBEL PRIZE

A law was recently passed in Germany, motivated by political consideration and specifically by dissatisfaction with the selection of a Nobel peace prize winner, according to which German citizens are no longer permitted to accept a Nobel prize, and a national prize was created as a substitute. This new prize has just now been awarded on the occasion of the party congress in Nuremberg. Two physicians were among the prize winners: Professor Sauerbruch, Berlin ordinarius in surgery, and Professor Bier, the surgeon, now retired. The cash prize was divided between the two men so honoured, each of whom received 50,000 marks. (*J. A. M. A.*, Dec. 11, 1937, page 2002).

MEDICAL OXFORD AND THE DOMINIONS

Lord Nuffield has offered to the University of Oxford a further sum of £168,000 to provide more facilities for graduate students from South Africa, Australia, and New Zealand to share the advantages of the Oxford school. It is proposed to establish three demonstratorships to be held in turn in the departments of anatomy, biochemistry, pathology, pharmacology and physiology, and three assistantships to be held in the departments of medicine, surgery, obstetrics and gynæcology, anæsthetics, orthopædic surgery, and therapeutics. Universities of Australia, New Zealand and South Africa which grant medical degrees will in turn select holders from among their graduates who already hold research posts or who are eligible for them. It is also proposed that the university should appoint from time to time a visiting professor who would tour the Dominions to give information about the facilities for research in Great Britain and to find out the needs of the Dominions. (*Lancet*, Jan. 1, 1938, page 41).

GERMAN SOCIETY FOR STUDY OF THE CIRCULATION

The eleventh congress of the Deutsche Gesellschaft fur Kreislaufforschung will be held at Bad Nauheim on March 26th and 27th, 1938, under the presidency of Prof. W. Nonnenbruch. The main subject for discussion will be circulatory collapse, and the speakers will include Gollwitzer-Meier (Bad-Oeynhausen), Siebeck (Berlin), Kirschner (Heidelberg), Schoen (Leipzig), Henderson (New Haven), Ruhl (Berlin), Ewig (Ludwigshafen), Eppinger (Vienna), Fischer-Wasels (Frankfort-on-Maine), Clara (Leipzig). Further information may be had from Prof. E. Koch, at the Kerckhoff-Institut, Bad-Nauheim.

TENTH INTERNATIONAL MEDICAL CONGRESS FOR PSYCHOTHERAPY

The Tenth International Medical Congress for Psychotherapy will be held in England at Balliol College, Oxford, on July, 29th to August 2nd, 1938, by the invitation of a number of British Societies. It is hoped that a large gathering from all countries will be present. Further details may be obtained from the Hon. Secretary, Dr. E. B. Strauss, 81, Harley Street, London, W. 1.

VACCINATION IN SOVIET RUSSIA

Prof. Syssine, director of the State Institute of Public Health in Moscow, records a striking decline

of small-pox in Soviet Russia as the result of vaccination. It was not until 1918, after the Revolution, that a law was passed making vaccination compulsory. The effect of this measure was that small-pox which had hitherto been very prevalent, especially in rural districts and in remote parts of the country, at once showed a rapid fall in incidence. The number of cases, which in 1915 had been 126,518, sank to 18,514 in 1925, 10,345 in 1928, and 6406 in 1929. In the subsequent quinquennium there was a slight increase in the incidence of the disease, attributed to the unsystematic manner in which vaccination had been carried out in certain areas, but more vigorous measures were then adopted and the number of cases fell from 17,327 in 1934 to 3156 in 1935 and 385 in 1936, while in the first quarter of 1937 not a single case was notified. The amount of effort required to attain this result is illustrated by the following figures: in 1935 there were 47, 461, 305 vaccinations, of which 8,900,209 were primary and the remainder revaccinations, and in 1936 there were 39,869,718 vaccinations of which 8,426,647 were primary and 31,443,071 revaccinations. The number of institutes in Soviet Russia concerned in the preparation of vaccine lymph was 33 in 1937. The vaccinations were performed free of charge by the medical staff of out-patient departments, school doctors, and a special staff of vaccinators numbering about 7000. (*Lancet*, Dec. 4, 1937, page 1327).

MEDICAL EDUCATION IN BOMBAY

The following resolutions were passed at a meeting of the Medical Profession of Bombay held under the auspices of the Medical Association, Bombay North and the All-India Medical Licentiates' Association, Bombay Branch, at the National Medical College, Bombay, on Sunday, the 19th December, 1937, under the Presidentship of Dr. D. H. Dudha, M.D. (Bom.), M.R.C.P. (Lond.).

1. Whereas the present system of dual water-tight compartments of medical education existing in the Presidency, is not in the best interests of the Medical Profession or the public, this meeting requests the Hon'ble Minister of Health and Excise Dr. M. D. D. Gilder, M.D., F.R.C.S. to immediately take steps to abolish the L.C.P.S. Course as it exists in the Medical Schools at present, and raise the existing Medical Schools to University Standard as has been decided upon by the present Madras Government.

2. This meeting further requests the Government to so amend the Bombay Medical Act as to give adequate representation to the Licentiates in the Bombay Medical Council in proportion to their numbers and to have an elected President from amongst the members of the Council.

3. This meeting further urges that the existing Code of Medical Ethics be revised after duly inviting the opinions of various Medical bodies and the Medical Profession.

4. This meeting supports the proposed move by the Hon'ble Minister of Health, Bombay, to have a separate Register for Practitioners in Ayurvedic and Unani systems of Medicine as it will tend to stop quackery.

BOMBAY MEDICAL COUNCIL

The following extracts from a summary of the proceedings of the meeting of the Bombay Medical Council held on 8th November, 1937, are published for information:—

The Council proceeded to consider the position with regard to the (1) resolution passed by them at their February, 1937 meeting that the Medical Council of India be urged that the Government of Portuguese India be requested to allow all medical practitioners registered under the Bombay Medical Act, 1912, to practise in Portuguese India and (2) the reply from the Medical Council of India that the matter is outside their scope and that any extension of local reciprocity should be negotiated for by and at the discretion of the Bombay Medical Council and it was decided that the matter be referred back to the Executive Committee to consider and report on the question of advisability of further urging the Government of Portuguese India to allow all medical practitioners registered under the Bombay Medical Act, 1912, to practise in Portuguese India.

The Council proceeded to consider the application of Dr. Hermann Selzer, M.D. (U. Rome), for registration under section 7 (1) or 7 (1a) of the Bombay Medical Act, 1912, and resolved that the matter be referred back to the Executive Committee (i) for stating the conditions under which Tables (G) and (H) in the Bombay Medical Register showing the qualifications registrable as additional qualifications were drawn up and (ii) for finding out the names of the Institutes in the Kingdom of Italy referred to in Government Notification, General Department, No. 6675, dated 12th October, 1937.

The Council proceeded to consider the charge of giving a false certificate of death and consequently being guilty of infamous conduct in a professional respect against Mr. Dattatraya Sadashiv Fathre, M.B., B.S., and decided that he has been guilty of the charge and directed the Registrar to erase his name from the Bombay Medical Register.

The Council proceeded to consider further the application of Mr. G. S. Kasyapi, L.M. & S., for the restoration of his name to the Bombay Medical Register and resolved that the consideration of the application be postponed to the next meeting of the Council and that he be asked to be present at that meeting.

The Council proceeded to consider the proposal of the Government of Sind, forwarded by the Government of Bombay for opinion, that one out of the six seats of nominated members under

clause (b) and two out of the six elective seats under clauses (c) and (d) of sub-section (2) of section 2 of the Bombay Medical Act, 1912, be reserved for Sind, and it was resolved by a majority that the present arrangement may continue until a separate Council is formed for Sind.

The Council proceeded to consider the proposal made by the Executive Committee that the Legal Department of the Government of India be requested to include in the new Insurance Bill a provision that Insurance Companies should employ only registered medical practitioners as medical examiners and referees and it was resolved that the Bombay Government be requested to represent the matter to the Government of India, that the President be authorised to write a memorandum making out a case for the employment of registered medical practitioners only as medical examiners and referees by Insurance Companies and that a copy of each of the resolution and the memorandum be sent to each Provincial Medical Council for such action as it deems proper and with a request that immediate effect be given to it.

The Council proceeded to consider the position with regard to the resolution adopted by the Medical Council of India with reference to the correspondence regarding the question of recognition for registration of medical qualifications of the American Universities, viz., " that this Council is of opinion that Indian Nationals who have obtained qualifications of repute in foreign countries should not be granted recognition in India unless such foreign countries recognise the qualifications of this country on a basis of complete reciprocity," and it was resolved that the Bombay Medical Council agrees with the above resolution, subject to the proviso that the restriction embodied in that resolution should not be operative till the end of 1942 so far as the Indian Nationals are concerned.

The Council proceeded to consider the letters from the Chairman of the Provincial Branch of British Empire Leprosy Relief Association (Indian Council) and the Government of Bombay, requesting, in accordance with the revised constitution of the Branch, that a member be elected to represent the Council on the Provincial Branch and Mrs. Cecilia D'Monte, L.M. & S., F.C.P.S., was accordingly elected as the representative of the Council on the Branch.

The Council proceeded to consider and passed a motion made by Dr. Jivraj N. Mehta, M.D. (Lond.), etc., and seconded by Mr. C. A. Amesur, M.S. (Lond.), that the Executive Committee be requested to submit amendments to clause (7) of rule 12 of the Rules of the Council regulating elections to the Council so as to ensure secrecy of the ballot.

The Council proceeded to consider and passed a motion made by Mr. U. B. Narayanrao, L.C.P.S., and seconded by Mr. V. D. Sathaye, L.C.P.S., that the proposal of the former, for amending (i) section 2 of the Bombay Medical Act, 1912, so as to fix the number of members of the Council at 14, to provide for the election of the President annually, to reduce the number of nominated members from 6 to 4 and to increase the number of members elected under clause (d) from 2 to 5 and (ii) section 5 so as to omit the word " previous " from clauses (1) and (2) of it, be referred to the Executive Committee in the first instance.

The Council proceeded to consider and passed a motion made by Mr. V. D. Sathaye, L.C.P.S., and seconded by Mr. U. B. Narayanrao, L.C.P.S., that the Council is of opinion that the practice of getting countersignature on medical certificates granted by registered medical practitioners is against the principles and spirit of the Bombay Medical Act, VI of 1912, [section 10 (2)] and recommends to Government to put a stop to this practice and it was further resolved that the President be requested to take the matter up with the Honourable Minister and press for the acceptance of the Council's view.

The Council proceeded to consider a " Bill to prohibit the conferment of unauthorised medical degrees, etc., and assumption thereof " received from Government for the opinion of the Council and it was resolved (1) that the Council is in favour of the Bill which is practically on the lines of the Bill to amend the Indian Medical Degrees Act, 1916, previously submitted to Government by the Council, and will communicate its views later regarding the details of the Bill and (2) that the matter be referred to the Executive Committee for consideration and report.

The Council proceeded to consider a motion made by Dr. Jivraj N. Mehta, M.D. (Lond.), etc., and seconded by Mr. C. A. Amesur, M.S. (Lond.), that the words " under the Medical Acts or " in line 3 of clause (1) and in line 3 of clause (2) of section 10 and in line 8 of section 11 of the Bombay Medical Act, 1912, be deleted and that the words " if reciprocity of registration has been arranged with the General Medical Council, London," be added between the words " shall " and " be " in line 2 of clause (1) of section 7, and it was resolved that the matter be referred to the Executive Committee in the first instance.

The Council proceeded to consider a motion made by Dr. Jivraj N. Mehta, M.D. (Lond.), etc., and seconded by Dr. F. T. Patel, M.D. (Lond.), etc., suggesting (1) that the Bombay Telephone Company be requested to make certain alteration in their Telephone Directory, e.g., giving separate lists of " Veterinary Surgeons " and " Dental Surgeons," (2) including in the special list of " Doctors " only those who hold medical degrees or diplomas, irrespective of the fact whether they are registered or not, and (3) showing the medical qualifications properly, etc., and it was resolved that the matter be referred to the Executive Committee for consideration and report and that the Committee be requested at the same time to go into the question whether any action could be taken under the Indian Medical Degrees Act, 1916, against any of the practitioners mentioned in the Directory.

* * *

The Bombay Medical Council will welcome suggestions from registered medical practitioners, medical associations, etc., regarding the revision of the Code of Medical Ethics. The suggestions should be sent to the Registrar, Bombay Medical Council, at 19, New Marine Lines, Bombay.

PUNJAB MEDICAL JOURNAL PRIZES

Prizes of the value of Rs. 50/- each will be awarded to the contributors of approved articles on "Medical Practice in India" and "Tuberculosis".

The articles which should be submitted in English will be judged by a small board of examiners whose decision will be final. The articles should reach the Editor, The Punjab Medical Journal, Banga (Punjab) on or before 15th April, 1938. The Editor reserves the right to publish all the articles received.

THE ALL-INDIA POPULATION AND FAMILY HYGIENE CONFERENCE

The All-India Population and Family Hygiene Conference which was to be held in January, 1938 will be held at Bombay from the 16th to 19th April, 1938 (Easter Holidays). Members and delegates wishing to submit papers and attend the sessions should write early to the Honorary Secretaries at No. 8, Ormiston Road, Appollo Bunder, Bombay.

ALL-INDIA OBSTETRIC AND GYNÆCOLOGICAL CONGRESS, BOMBAY

The 2nd All-India Obstetric and Gynæcological Congress will be held at Bombay from the 13th April to 16th April, 1938, under the Presidentship of Dr. B. D. Mukherji, of the Carmichæl Medical College, Calcutta. Those who desire to attend the Congress should communicate to the Organising Secretary, Raj Bhuvan, Sandhurst Road, Bombay 4.

A Medical Exhibition is being organised under the auspices of the Congress. Manufacturers desirous to participate should inform the Hon. Secretary as soon as possible.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION

Thanks to the generous assistance of the Rockefeller Foundation, a bureau for the assistance of research workers in Psychiatry has been established under the auspices of the Royal Medico-Psychological Association.

The objects of the Bureau are the following:—

1. Any psychiatrist who wishes for special information as to what is at present known on any subject of interest to himself is invited to notify the Secretary of the Bureau. A bibliography of all recent papers relating to the subject will be sent to him together with abstracts of such communications as may seem of great importance, and should he then desire abstracts of any particular papers, especially those published in foreign languages, they will be made for him on demand.

2. Any worker who wishes to start some particular research may on application obtain information as to what has already been done on the subject, and what methods of procedure are advised for further work.

3. Any worker who desires further elucidation on points of technique will be either advised directly from the Bureau or put into direct communication with the appropriate members of a panel of experts who have kindly consented to advise on technical questions.

4. Workers desiring the loan of technical manuals for purposes of their work may obtain them on application.

5. Workers desiring to see personally the application of methods of research or treatment, or to confer personally with expert advisers will be eligible to receive small grants to enable them to do so. These grants which will be made by the Committee are intended to cover the expense of visits of a few days to laboratories at home or abroad, and are primarily for the use of medical officers who might be unable to make such visits at their own expense.

6. A short account of recent advances in subjects of particular interest together with a fairly complete bibliography will be issued at intervals and sent to any psychiatrist who may signify a desire to receive it.

7. Psychiatrists who would like to be put into communication with other workers abroad can receive help from the Bureau.

8. Although it is very much hoped that all British psychiatrists will be members of the R. M. P A., the services of the Bureau and the eligibility for grants is open to any psychiatrist working in the British Empire.

The Committee of the Research Bureau will consist of Sir Hubert Bond, F.R.C.P., Dr. J. Brander, F.R.C.P., Dr. G. W. T. H. Fleming, D.P.M., Prof. F. L. Golla, F.R.C.P., Dr. P. K. McCowan, F.R.C.P., Dr. W. D. Nicol, M.R.C.P., Dr. G. W. Smith, O.B.E. and Dr. R. M. Stewart, M.R.C.P.

All communications should be addressed to the Research Bureau, The Royal Medico-Psychological Association, 11, Chandos St., W. 1. London.

BOOK REVIEWS

PROTOFORMOTHERAPY IN TREATMENT AND PREVENTION. By Dr. N. E. Inschlondsky. 1937, Royal 8 vo., pp. xxiv+237+xl. Henry Kimpton, London.

In this book the author has put forth before the medical profession the result of his research work of 15 years' duration on a new scientific line. In the first few pages of the book the author has briefly narrated the story of evolution of this branch of science. Protoformotherapy, as the author intends the term to mean, may be said to be a science that deals with the action of the 'protoformative incret' on the living organism in health and disease. The author has used the term "Protoformative incret" to denote the specific stimulative substances that are present in the embryonic tissues of mammals at the end of the 3rd month and beginning of the 4th month of intrauterine life. This protoformative incret can be isolated by a complicated process. When injected into an animal this incret, as the author has stated exerts an action of a 'multispecific nature" upon the animal body 'stimulating its own creative and restitutive mechanisms, in the first place its endocrine apparatus and the central nervous system." In morbid conditions therefore the action of the incret is not one of substitution therapy but of active therapy. The author reports encouraging and favourable results of protoformotherapy in various conditions such as endocrine disorders, nervous system disorders, anæmias, chronic infections like tuberculosis etc., and has also put forth prospects of its application as a preventive measure against tuberculosis, carcinoma, premature senility, etc. In support of his contentions the author has put forth in his book in some details both experimental and clinical data. Protoformotherapy is a specialised development of biology and has before it a really prosperous future. It has opened up an enormous field for research workers. The author is to be warmly congratulated for his researches and now for putting before the medical world the results of his researches in the form of a book.

J. Ghosh.

THE PRACTITIONERS LIBRARY OF MEDICINE AND SURGERY, Volume XIII (Preventive Medicine and Hygiene) 1937, Royal 8 vo., pp. xxxvii and 993; D. Appleton-Century Co., New York, London.

The contents of this volume consist of contribution from a number of learned authors with vast experience in the various branches of Preventive Medicine and Hygiene. The role of individual hygiene in Preventive Medicine is receiving greater recognition at the present moment. This volume besides dealing with the communal aspect of hygiene and public health, which will always be essential, has discussed the individual aspect of hygiene very elaborately. It deserves a place in every medical practitioner's library.

M. U. Ahmed.

MODERN ADVANCES IN RURAL PRACTICE —By P. C. Dutta, M.B. (Cal.), F.R.C.S. (Edin.), D.G.O. (Dub.), Capt. I.M.S. Demy 8 vo., pp. 174. 1937. Butterworth & Co. (India), Ltd., Calcutta.

The author is to be congratulated in his successful attempt to put before the rural practitioner in a book form the recent advances in all branches of medicine. Rural doctors who have neither the time nor the money to spend over the enormous literature that is being published everyday will find the book very useful. The author is very careful in avoiding useless superfluity and has made the book practical and handy. The inclusion of tables giving caloric value of various Indian foodstuffs and of the different laboratory tests for clinical diagnosis and of the salient points in differential diagnosis of the important common diseases has added to the practical value of the book.

P. G.

MODERN TREATMENT IN GENERAL PRACTICE, Vol. III. Edited by Cecil P. G. Wakeley, D.Sc., F.R.C.S., F.R.S.E. Demy 8 vo., pp. xliii+436, 1937. Butterworth & Co. (India), Ltd., Calcutta.

The editor is to be congratulated for publishing the third volume of the popular series "Modern

Treatment in General Practice." The articles chosen are useful, the matter contained in them are reliable, up-to-date and presented in a most readable form. Though some of the articles written are highly technical and will be of little practical use to the practitioner at large still they are of great academic interest and will certainly be read with profit. It is with greatest pleasure that the book is recommended to the general practitioner who undoubtedly will find it very serviceable.

P. G.

A PRACTICAL GUIDE IN THE TREATMENT OF EYE DISEASES. (Operative and Medicinal). By K. K. Krishnamurty. Crown 8 vo., pp. 87.

In this small book all the important operations met with in ophthalmic practice have been discussed, some of them quite elaborately. Unfortunately there are also places where the description is not lucid enough. The medicinal portion is nothing but an enumeration of the therapeutic agencies used in eye diseases. "The synopsis for treating eye diseases" will be of little use either to the general practitioner or to the specialist in the branch. It is unfortunate that even the long list of errata does not cover all the errors in the book. The printing, the diagrams and the paper leave much for improvement.

N. K. Munshi.

STATE INSURANCE AND PANEL PRACTICE FOR INDIA. By C. P. Chaube. 1937. Crown 8 vo., pp. 228. Published by the author from Delhi.

It is a timely publication, when the state and the medical profession seem to be thinking with some earnestness the question of medical relief of the people of India in general. The problem of affording medical relief to its vast population is a very intricate one. The author has quoted some facts and figures of other countries, to show how this question has been handled and solved step by step. He also throws in here and there, some suggestions how this question can be tackled in India. That is what can be said in favour of this book. After going through the whole of this book one is filled with great disappointment. In the vervosity of unfamiliar jargons and combination of words and phrases, the exact meaning of the author is left utterly vague. The book is all words without much substance. The first one hundred pages are of no or little use to the main contention of the book. It were better if he began with the problem of State Insurance. The whole subject could have been better dealt with in no more than thirty pages. The author altogether does not seem to possess the correct perspective of the complexities of interest in the problem in relation to the State management. He seems to take only one-sided view and never misses a chance to have a tilt at the State.

S. C. Sen Gupta.

ERRATUM

January, 1938 issue, page 198, 2nd column 4th line from the bottom *instead of* 13,502, 1936. Indian Journ. Med. Res., 22, *1st read* obtained sunlight but no vitaminous food. It